RECLAMATION

Managing Water in the West

Safety Culture in the PN Region

Research and Development Office
Science and Technology Program
Final Report ST-2017-7252-01

U.S. Department of the Interior
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Bureau of Reclamation
Research and Development Office

Sept. 1, 2017

Mission Statements

Protecting America's Great Outdoors and Powering Our Future

The Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities.

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14. ABSTRACT *(Maximum 200 words)* The project team from the UNC Gillings School of Global Public Health (UNC) was contracted to conduct a safety culture assessment of the USBR Pacific Northwest Region (PNR). The goal during Year 1 was to understand the region's workplace injuries, identify where and how to collect data on the safety culture, and identify what specific cultural information to seek. The goal during Year 2 was to interview employees about their work and their perception of safety culture. From the interviews, UNC identified 14 safety culture themes which were compared to findings and recommendations from the USBR 21 safety action teams. The themes are presented in three groups: Administrative culture, Management/Employee culture, and Components of the Safety Management System. With an increased attention to safety as a core value, PNR is well-positioned to plan sustainable improvements based on the

specific findings of this report. Current PNR initiatives could contribute toward improvements in these 14 safety culture themes, but the region should verify how those efforts would address the specific findings from the UNC assessment. A brief summary of select findings and suggested improvements is provided for each theme group. A multi-level approach is needed to develop change strategies that target the organization, work environments, and all employees including managers. PNR should use a participatory process to plan how best to integrate the assessment findings and develop regional improvements, some of which could be tailored to accommodate sub-cultures within each Area/Facility. Participatory processes can more deeply engage employees and managers.

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BUREAU OF RECLAMATION

Research and Development Office
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River Systems Restoration, PN Region

Final Report ST-2017-7252-01

Safety Benchmarking Study: Safety Culture in the PN Region

This report was prepared by the University of North Carolina for Reclamation, therefore no internal Reclamation peer review was conducted.

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Executive Summary

Purpose

The project team from the UNC Gillings School of Global Public Health (UNC) was contracted to conduct a 2-year safety culture assessment of the USBR Pacific Northwest Region (PNR).

Methods

Year 1: The goal during Year 1 was to understand the region's workplace injuries, identify where and how to collect data on the safety culture, and identify what specific cultural information to seek. Specific methods included a review of peer-reviewed and trade literature to identify safety culture constructs (n=32) that guided document analysis and the development of interview questions. To obtain contextual information about safety related issues in a federal workplace and, UNC reviewed approximately 70 reports and other materials from the Department of Interior, Office of Personnel Management, OSHA, Reclamation, and PNR. UNC coded PNR's safety evaluations and incident reports to the 32 safety culture constructs and analyzed thematic patterns. They also conducted an analysis of PNR's SMIS data (de-identified of all employee names and personal information) to understand the injury trends over 13 years (2002-2014), and to identify the most hazardous jobs in the region.

Year 2: The goal during Year 2 was to interview employees about their work and their perception of safety culture. During the Fall of 2016 and Spring of 2017 UNC conducted 96 interviews with 167 (15%) of the region's 1,132 employees, and benchmark interviews with 8 organizations to learn about safety culture dynamics in other high- hazard organizations. UNC also thematically coded the USBR 21 Safety Action Team reports and the PNR-specific responses from Team 14's employee survey data. Qualitative research methods were used to analyze the data sources and triangulate them into thematic results.

Results

From the interviews, UNC identified 14 safety culture themes which were compared to findings and recommendations from the USBR 21 safety action teams. The themes are presented here in three groups:

1. **Administrative culture (2 themes)**
    - **a.** Hiring process
    - **b.** Procurement process
2. **Management/Employee culture (4 themes)**
    - a. Management relationship with workers
    - b. Management communication with workers
    - c. Management responsiveness to safety concerns

d. Coworker dynamics

3. **Components of the Safety Management System (8 themes)**
    a. Employee perceptions of Safety staff
    b. Safety Committees
    c. Safety training
    d. Work planning and Standard Operating Procedures
    e. Job Hazard Analysis (JHA)
    f. Employees' reporting of safety incidents and near misses
    g. Incident investigations
    h. Dissemination of Incident and Near Miss information

Discussion

With new leadership in place, and an increased attention to safety as a core value, PNR is well-positioned to plan sustainable improvements based on the specific findings detailed in the Results section of this report. Current PNR initiatives could contribute toward improvements in these 14 safety culture themes, but the region should verify how those efforts would address the specific findings from the UNC assessment. A brief summary of select findings and suggested improvements is provided for each theme group.

Administrative culture *(2 themes)*

To improve the region's safety culture, PNR will need to address some of the administrative barriers that appear to diminish the ability of Craft/Trade workers to efficiently and effectively do their jobs. This includes ensuring the hiring process can successfully recruit the most skilled applicants, and that a procurement system can handle the seasonal variation in purchase requests while providing valuable customer service that facilitates large purchase requests.

Management/Employee culture ***(4 themes)***

To improve the region's safety culture, PNR will need to improve communication dynamics between management and employees which seem to currently cause confusion and distrust regarding roles, responsibilities, and the value of the worker to PNR. Managers will need to become aware of how their decisions can have broad and possibly unexpected impacts on safety in the workplace. Communication systems will need to ensure messages penetrate from top to bottom. Communication could also promote the safety culture with stories and images of safe work team dynamics.

Components of the Safety Management System (SMS) *(8 themes)*

To improve the region's safety culture, PNR will need to enhance select components of the safety management system. Safety staff need additional training in order to become a source of

proactive support to workers. Safety Committees need to clarify their purpose and meeting process to ensure they can translate issue discussion into formal recommendations and action. All trainings need instructors who are knowledgeable and technically competent, and also skillful at using adult-learning methods. PNR should incent employees to report incidents and near misses. PNR should take more precautions to protect worker identities when communicating about incidents and near misses, and create a standard process for providing follow-up information across the region.

Recommended Approach

The 14 safety culture themes provide a focus for PNR's efforts at improvement. Although a behaviorally-based approach to improving safety is necessary, it is not sufficient to effect sustained improvements. A multi-level approach is needed to develop change strategies that target the organization, work environments, and all employees including managers. PNR should use a participatory process to plan how best to integrate the assessment findings and develop regional improvements, some of which could be tailored to accommodate sub-cultures within each Area/Facility. Participatory processes can more deeply engage employees and managers.

Such a participatory process could:

1. Engage with employees at multiple levels of the organization, possibly through existing Safety Committees and additional working groups
2. Review the assessment findings in the 14 themes to:
    a. Identify differences in the findings and plan for adaptation as needed across:
        i. Areas (CCAO, GCPO, SRAO, PNRO)
        ii. Employee type (Craft/Trade, Foreman, Supervisor, Safety Staff, Middle-Management, Leadership)
    b. Identify how the concerns might be partially addressed by:
        i. Implementation planning by the USBR 21 safety action teams
        ii. PNR's current initiative
3. Plan how to implement recommendations from all data sources, and identify additional ideas for improving the identified concerns
4. Create timeframes for planning, piloting, and future monitoring

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Main Report

The work for this project was completed, in whole, by the University of North Carolina. The entire report provided as the deliverable is provided as Appendix A.

Appendix A – Safety Benchmarking Study, University of North Carolina, 2017

Safety Culture Assessment

U. S. Bureau of Reclamation - Pacific Northwest Region (PNR)

Final Report

July 28, 2017

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Acronyms and Terminology

This report uses acronyms, including:

- CC – employees working in the Columbia-Cascades area
- CCAO – Columbia-Cascades Area Office
- CDSR – Collateral duty safety representative
- CT – craft and trade employees
- DOI – United States Department of Interior
- F – foreman
- FW – federal wage employee (can serve as a proxy for Craft/Trade positions)
- GC – employees working at Grand Coulee
- GCPO – Grand Coulee Power Office
- GS – general schedule employee (can include office staff and middle management)
- M – managers
- PNR – Pacific Northwest Region
- PNRO – Pacific Northwest Regional Office
- RO – employees working in PNRO
- SE – senior executive (includes upper management)
- SOH – safety and occupational health
- SR – employees working in the Snake River area
- SRAO – Snake River Area Office
- SS – employees working in the various safety programs (Area, Regional)
- USBR – United States Bureau of Reclamation
- X – supervisors

This report also includes some terms that might have different connotations in other contexts:

- Management – all supervisory and managerial employees from supervisors up to the PN Regional Director

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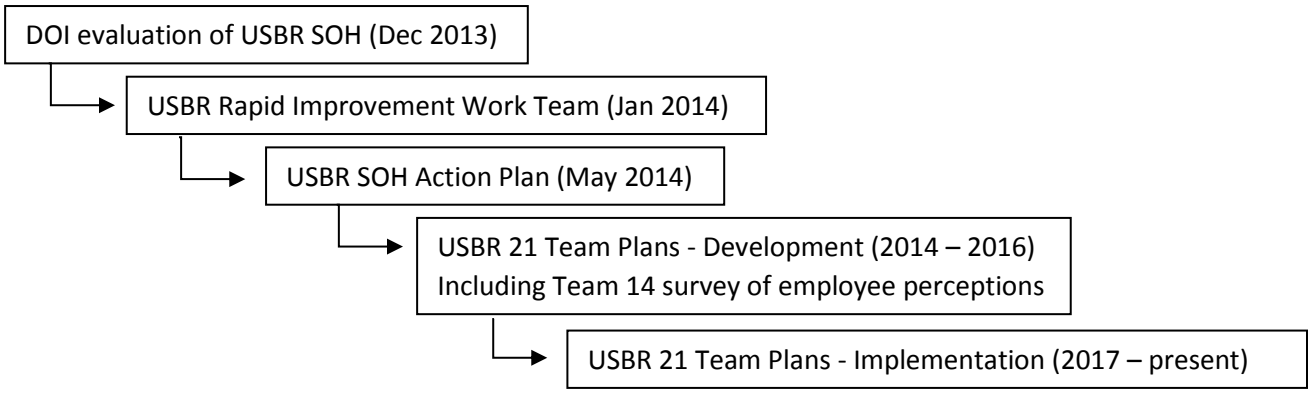
Section 1: Background

The U.S. Department of Interior evaluated the U.S. Bureau of Reclamation's (USBR) safety and occupational health (SOH) program in December 2013 (Figure 1). The evaluation found that USBR had failed to establish safety as an organizational value, and had developed "cultural complacency" about workplace hazards, safety non-compliance, and incomplete SOH program implementation. Subsequently USBR formed a "rapid improvement work team" which helped inform the development of the Reclamation's May 2014 SOH Action Plan and the formation of 21 safety action teams. Over a 2-year period the teams investigated specific SOH topics and made recommendations for Reclamation to improve its SOH program. By the Summer of 2017 the agency had begun planning how to implement the 21 teams' recommendations.

Figure 1. Timeline of Assessments Informing the Need for PNR Safety Culture Improvement



As part of the agency's focused endeavor, USBR's Pacific Northwest Region (PNR) wanted to assess the safety culture throughout their workplaces, and contracted with faculty and staff at the University of North Carolina Gillings School of Global Public Health (UNC). The safety culture assessment project was implemented from July 2015 - June 2017 in two year-long steps: 1) secondary data analysis, and 2) additional data collection and analysis. This report provides information from each step.

Section 2: Project Year 1 – Secondary Data Analysis

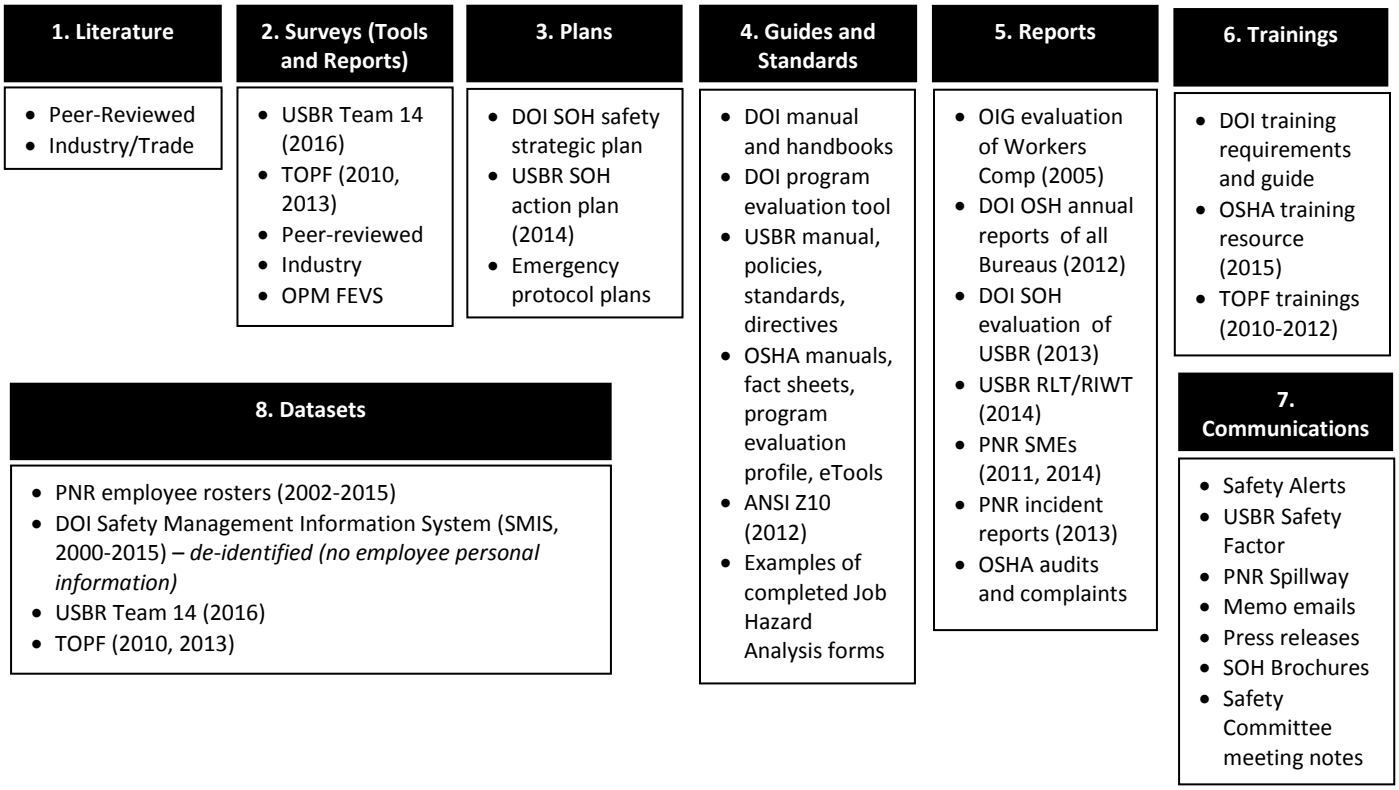
UNC's goal for the first year was to understand the region's workplace injuries, and identify where and how to collect data on the safety culture and what specific cultural information to seek.

METHODS (YEAR 1)

UNC collected and reviewed multiple sources of information for the safety culture assessment project (Figure 2). Secondary data included information disseminated by PNR, USBR, and the Department of Interior such as employee rosters, injury datasets, safety program manuals or guides, safety action plans, safety annual reports, safety business practices, safety evaluations, safety incident reports, internal communications such as memos, newsletters and safety alerts, descriptions and photographs of each Reclamation "project" and its facilities, workers compensation annual reports by the Office of Inspector General, and capital improvement plans and presentations by the agency

and the Bonneville Power Administration (BPA). UNC also received results from safety culture surveys and trainings conducted in the Snake River Area by TOPF Initiative (a consultant group). All sources were inventoried and inspected for completeness and usefulness (Appendix A).

Figure 2. Types of Secondary Data Informing the Safety Culture Assessment Project



Literature Review and Safety Culture Taxonomy

The purpose of the literature review was to guide the development of a conceptual framework for assessing safety culture in Year 2 of the project. UNC developed a list of terms for using both Scopus and Google Scholar search engines to identify literature published within 25 years of the project date (1990-2015), however, earlier seminal publications were also included in the review. In addition, the team consulted the Cochrane Library of evidence-based research. The resultant list of relevant literature included: i) systematic reviews, ii) meta-analyses, iii) academic research, iv) government reports; and v) industry (trade) literature.

Article selection focused initially on systematic reviews and meta-analyses, and subsequently included the research studies cited within those reviews. Definition of safety culture/climate and relevant constructs or variables were abstracted from the selected articles. From this process, UNC compiled a list of safety culture constructs. The constructs were then compared to existing safety assessment tools developed after the year 2000 by academic, government, or industrial sources. The 405 assessment questions from these tools were coded to the constructs. A subset of 255 questions was then coded independently by a second coder, and the inter-rater reliability was calculated in IBM SPSS version 24 (2017) using the intraclass correlation coefficient (ICC = 0.864 which is considered

acceptable). To improve the coding results, the 84 questions receiving different codes were examined by the team and coding consensus was reached for each.

From this process, a Safety Culture Taxonomy was developed for use throughout the remainder of the project (Appendix B). The Taxonomy was used to code all secondary data obtained from the agency, and to guide the development of assessment interview questions for use in Year 2 of the project.

PNR Employee Rosters, Injury Data, and Agency Reports

Employee Rosters and Injury Data (de-identified)

UNC received organizational employee roster datasets from the agency's Human Resources office for the years 2002 through 2015. UNC checked the data quality and then merged the datasets to track each employee's progress through jobs (OccCode), work groups (OrgCode), and payment plans (which can be used in some analysis conditions as a proxy for type of work conducted). The OccCodes were nationally standardized for federal employees (*U.S. OPM Handbook of Occupational Groups and Families*), but the OrgCodes are unique to PNR and were changed multiple times during the 2002-2014 time period. UNC tracked each employees work history through the various PNR and Area restructurings to ensure that appropriate OccCodes and OrgCodes were used during analysis.

UNC received a de-identified injury dataset from the DOI Safety Management Information System (SMIS) for the years 2000 through 2014 (NOTE: UNC received the 2015 injury data in the second year). No employee names or other personal identifiers were included in the dataset. To prepare for analysis, the injury data were limited to the same initial year as the PNR employee roster data (2002), and were grouped into two date ranges (2002-2009, 2010-2014) surrounding a major PNR restructuring that reduced the number of regional office employees (e.g., education, administration, and medical/health). For any injuries that were not clearly designated as occurring at a specific PNR facility, proxy data (e.g., geographic coordinates, site photographs, or street addresses) were used to assign the injury to a facility. **Data Limitations:** Because the data were de-identified, it was not possible to track individual employee injuries over time, calculate injury rates, nor was it possible to link injury data to occupation tenure or payment plan. Without employee identifiers it was also impossible to screen for repeat injuries in the same employee. An injury to employee ratio was calculated for each Area, but this process assumed that the number of employees with repeat injuries would be relatively small and equally distributed across areas. Injury hour was frequently left blank during data entry and would default to 12:00AM (i.e., the start time for the date of injury); therefore, for purposes of analysis all times of 12:00AM were recoded to "unknown."

Although both recordable and non-recordable injuries were initially analyzed, analysis methods and results are reported primarily for recordable injuries. The annual average number of recordable injuries was calculated for each date range (2002-2009, 2010-2014). The same calculation was applied to each occupation (OccCode, n=179) and organizational "department" (OrgCode, n=327) for each date range. Because injury rates could not be calculated for specific OccCodes and OrgCodes without employee identifiers, UNC used the total number of injuries for each OccCode or OrgCode (and OccCodes within OrgCodes). The calculation of an injury to employee ratio for each OccCode or OrgCode was deemed unsuitable because of the smaller number of employees and the potential for a more significant influence on any ratio from an employee having repeat injuries.

UNC then calculated the annual average number of injuries (2010-2014) for each OccCode and selected the 10 most injurious OccCodes (which represented 79.5% of the recordable injuries and 45.4% of the employees). They linked each of those 10 OccCodes to all of their past OrgCodes, and stratified the combinations according to whether a recordable injury had occurred in the 2010-2014 timeframe (to ensure the interviews revealed a breadth of

experience from both injury and non-injury departmental histories). In the final step, stratified employee lists were developed for the 10 high-injury OccCodes in each PNR location (CCAO, GCPO, SRAO, PNRO).

Agency Reports

UNC reviewed the agency-related action plans, safety management evaluations (SME), incident reports, and OSHA audits/complaints submitted to the project in 2014 (Appendix A). Each plan and report was reviewed to abstract findings and recommendations which were then coded to the safety culture Taxonomy and the Department of Interior's SOH six evaluation components (DOI6). Additionally, each finding or recommendation was coded in terms of the type of feedback (i.e., positive comments, negative criticism, or a mixture of both), whether it had a corresponding recommendation for improvement, and whether the finding had been subsequently reported as addressed or corrected. UNC calculated the distribution of findings and recommendations across the safety construct Taxonomy, and stratified the findings by type of feedback and by recommendation follow-up.

The OSHA audits/complaints were similarly coded for findings and recommendations, however those data sources were excluded from further analysis because of the incompleteness of the reports as maintained by the agency and the state OSHA offices.

RESULTS (YEAR 1)

Safety Culture Taxonomy

The search for peer-reviewed literature related to safety culture or safety climate yielded 898 documents. Of those documents, 8 were review articles, 10 were systematic reviews, and 8 were meta-analyses (total of 26 publications). UNC began their literature abstraction process with the systematic reviews and meta-analyses. The 26 articles yielded 81 unique research sources which provided information on 123 variables related to safety culture and climate, some of which were similar in focus. Using a site-ordered matrix process (Miles & Huberman, 1994), UNC combined similar variables and reduced the list to 32 constructs which were grouped into 6 categories for a Safety Culture Taxonomy (Table 1).

Table 1. Safety Culture Taxonomy

- **Psychological (n=8)**
  - Values
  - Perceptions
  - Beliefs
  - Attitudes
  - Commitment
  - Norms
  - Responsibility
  - Knowledge
- **Behavioral (n=6)**
  - Competencies
  - Behaviors
  - Communication
  - Incident reports
  - Teamwork / Social Support
  - Learning/Adaptation
- **Organizational (n=18)**
  - Context (n=4)
    - Funding
    - Time/Workload
    - Turnover rate
    - Labor involvement in decision-making
  - Systems (n=5)
    - Policies
    - Procedures
    - Org Structure
    - System Evolution
    - Documentation (e.g. technical)
  - Management (n=4)
    - Management decisions/reactions
    - Attention to safety issues
    - Risk assessments
    - Training/Education
  - Environmental (n=5)
    - Work environment
    - Exposure to hazards
    - Safety equipment/hardware
    - Maintenance/inspection
    - Ergonomics

The safety culture taxonomy provided an evidence-based criteria for assessing secondary data sources and preparing assessment instruments for Year 2 data collection.

PNR Employee Rosters, Injury Data, and Agency Reports

Employee Rosters and Injury Data (de-identified)

From 2002-2014, PNR employed on average over 1,000 employees who were comprised of 30.9% Craft/Trade workers and 69.1% office workers. From 2002-2009 the region employed almost 860 office workers, but during the 2009-2010 restructuring they reduced that number to approximately 670 from 2010-2014 (a decrease of 22%). Then, in just one year (2015), the region increased the number of office workers by 6% to 712. In comparison, the number of Craft/Trade workers was approximately 337 from 2002-2009, and then 372 from 2010-2014.

Craft/Trade jobs have assumed a larger proportion of employees in PNR since 2010 when the office workers were reduced by almost 22% (Table 2). In general, the reduction of office staff at the Regional Office was the main contributor to this shift, and the three Area location have maintained a fairly consistent ratio of office to Craft/Trade employees: CCAO=2.2, GCPO=0.7, SRAO=1.7.

Table 2. Average Number and Percent of PNR Employees by Job Type and Time Period.

Job Type	2002-09	2010-14	2015
Office	858.8 (71.8%)	670.2 (64.3%)	712 (64.0%)
Craft/Trade	337.5 (28.2%)	372.2 (35.7%)	401 (36.0%)
Ratio[a]	2.5	1.8	1.8
TOTAL	**1196.3**	**1042.4**	**1113**

[a] Ratio of Office jobs to Craft/Trade jobs throughout the region.

<u>Annual Number of Injuries</u>

The total number of injuries in PNR from 2002-2014 was 1,671 with 837 (50%) classified as recordable injuries (Table 3). On average there were 76.8 recordable injuries per year from 2002-2009, which reduced to an average of 44.6 per year from 2010-2014. During the last two years of data (2013-2014) there was a significant increase in recordable injuries (and the injury incidence held in 2015 with 56 recorded), although during those same years there was a decrease in non-recordable injuries.

Table 3. Annual Number and Percent of Injuries by Injury Type (2002-2014)[a]

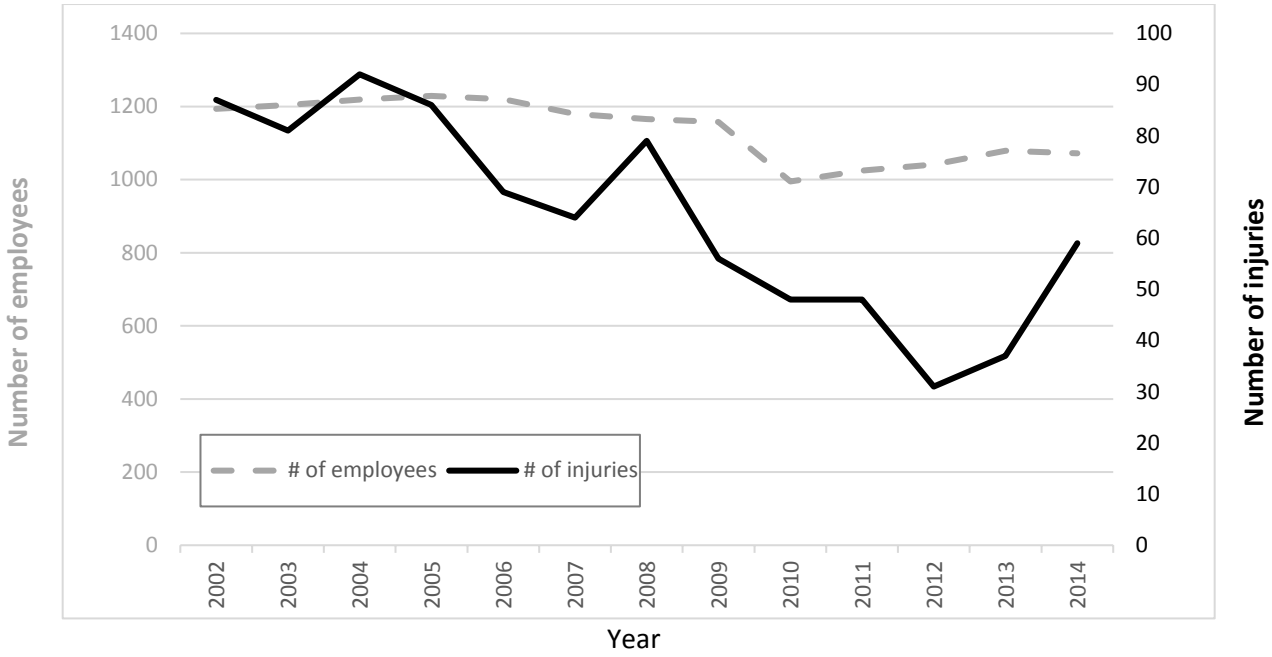
Injury Type	Number of Injuries																		
	Annual Number													Total 2002-14	2002-09		2010-14		2002-14	
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014		Mean	StDev	Mean	StDev	Mean	StDev
Recordable (n)	87	81	92	86	69	64	79	56	48	48	31	37	59	837	76.8	11.7	44.6	9.7	64.4	19.1
Non-Recordable (n)	110	120	91	67	50	66	69	47	29	34	67	53	31	834	77.5	25.1	42.8	14.8	64.2	27.5
Total (n)	197	201	183	153	119	130	148	103	77	82	98	90	90	1671	154.3	34.2	87.4	7.3	128.5	42.4
Recordable (%)	44.2%	40.3%	50.3%	56.2%	58.0%	49.2%	53.4%	54.4%	62.3%	58.5%	31.6%	41.1%	65.6%	50.1%	49.8%		51.0%		50.1%	
Non-recordable (%)	55.8%	59.7%	49.7%	43.8%	42.0%	50.8%	46.6%	45.6%	37.7%	41.5%	68.4%	58.9%	34.4%	49.9%	50.2%		49.0%		49.9%	
Change from previous year recordable (n)		-6	11	-6	-17	-5	15	-23	-8	0	-17	6	22	-28						
Change from previous year non-recordable (n)		10	-29	-24	-17	16	3	-22	-18	5	33	-14	-22	-79						

[a] US DOI, Occupational Medicine Program Handbook (2009), tab 9, page 5: "A recordable illness or injury is one that results from an accident or exposure in the work environment and results in death, an illness, or an injury that involves the requirement for medical treatment (beyond first aid), loss of consciousness, restriction of work or body motion, or transfer to another job."
Source: USBR PNR SMIS data

Number of Employees and Recordable Injuries

The relationship between number of employees and recordable injuries is illustrated in Figure 3 for the 2002-2014 time period. During those 13 years, the number of employees held fairly constant while the number of recordable injuries dropped markedly from 2004 through 2012 (with a spike in 2008), and then increased until 2014 (and held constant in 2015 according to later reported data). In two years (2012-2014) PNR lost approximately 50% of the improvement in injury incidence it had gained over an eight year period (2004-2012).

Figure 3. Annual Number of Employees and Recordable Injuries (2002-2014)



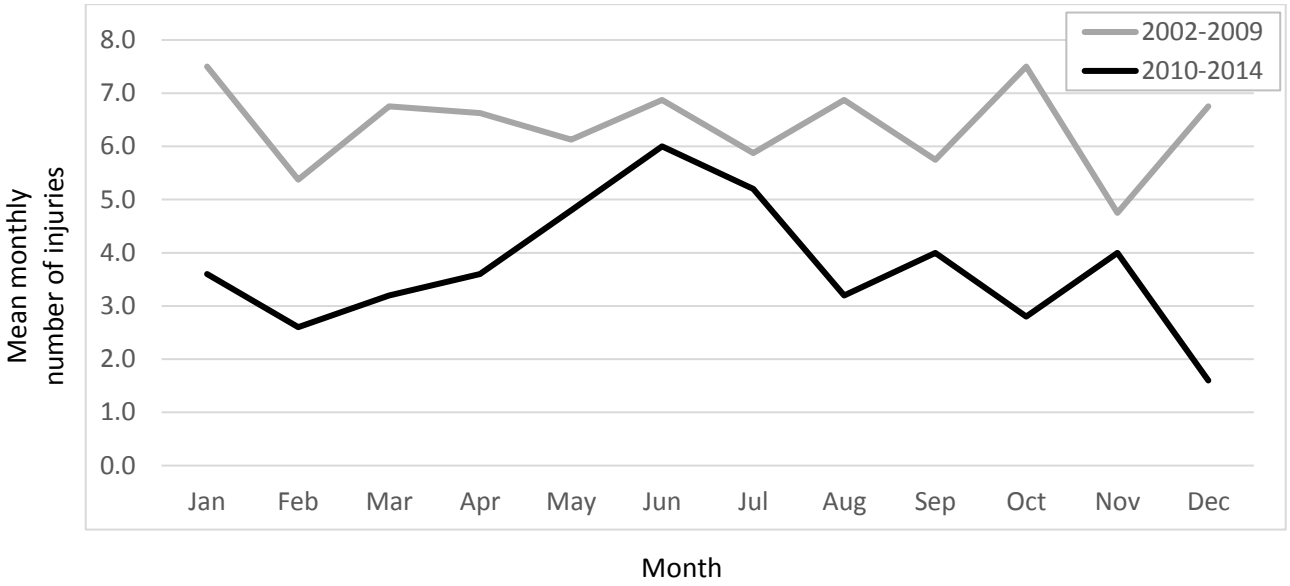
Sources:

- USDOI SMIS data for PNR
- USBR PNR Employee Roster

Monthly and Hourly Patterns of Injury

When monthly patterns were investigated, UNC found that PNR had developed new seasonal injury patterns after the 2009-2010 restructuring (Figure 4). June had become the new peak for recordable injuries. Prior to 2010, there had been no obvious peak, but rather a small seasonal increase in October.

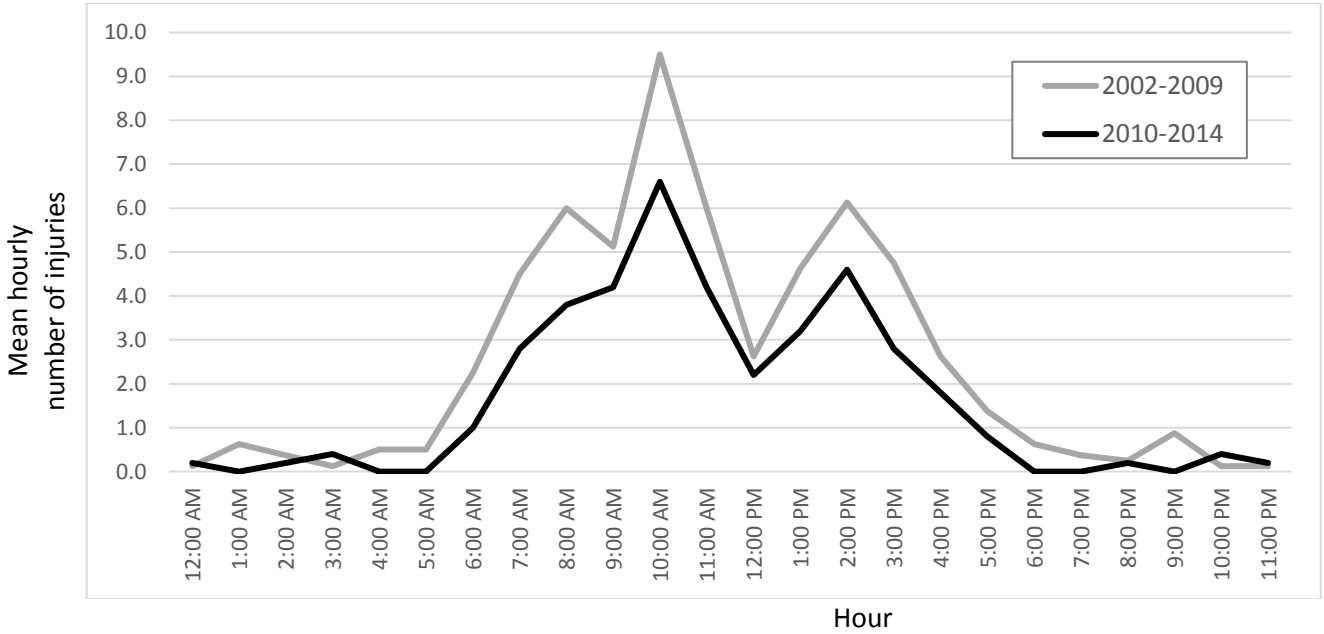
Figure 4. Monthly Number of Recordable Injuries by Time Period



Source: USDOI SMIS data for PNR

When hourly average injury incidence was graphed it became clear that the daily peak injury times of 10:00am and 2:00pm had remained constant since 2002, but the quantity of injury at those peaks had reduced slightly since 2009 (Figure 5).

Figure 5. Hourly Number of Recordable Injuries by Time Period[a]



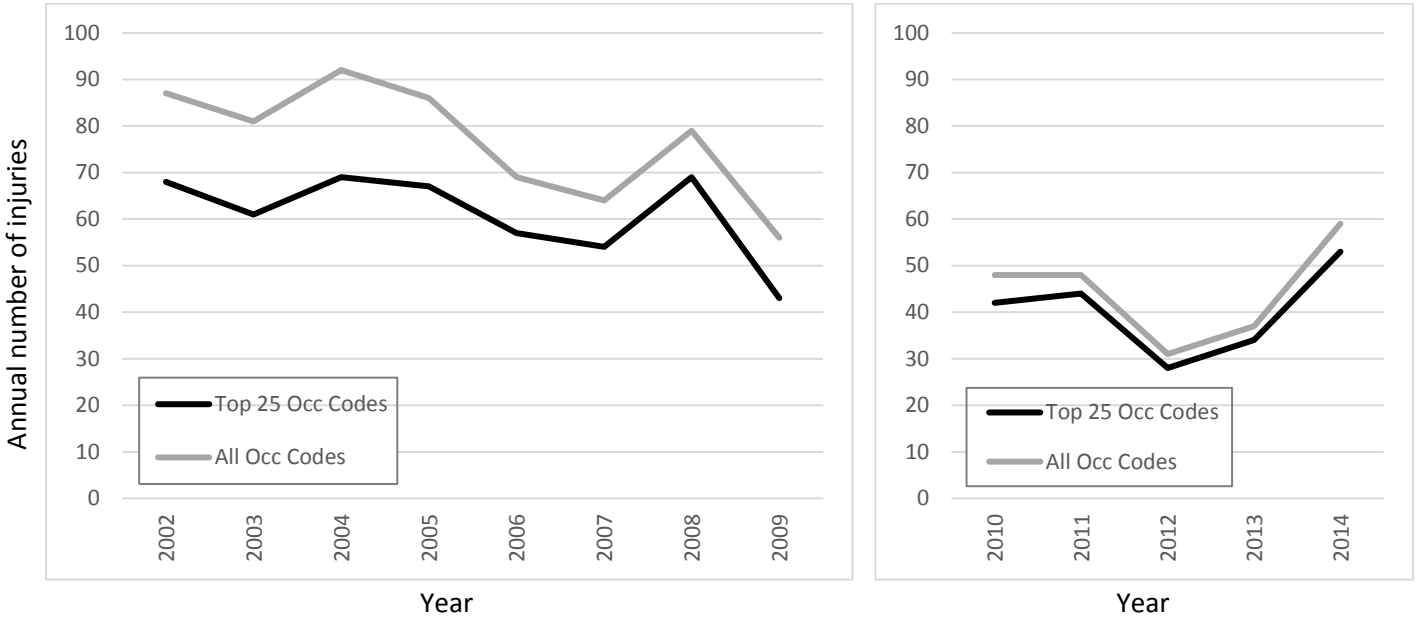
Source: USBR PNR SMIS data

[a] Missing/Unknown times (2002-2014) = 158 (18.9%)

25 Most Injurious Occupations

When the 25 occupations with the highest injury incidence ("Top 25") were compared to all occupations, their respective annual number of recordable injuries followed a similar decreasing pattern from 2002 to 2014 with injury peaks in 2004 and 2008, and an increase during the last two years (Figures 6). However, what is notable about their relationship is the diminishing gap over time. This means that with each passing year, the Top 25 occupations were responsible for more of the recordable injuries in the region. By 2010-2014 the Top 25 occupations accounted for 90.1% of all recordable injuries.

Figures 6. Annual Number of Recordable Injuries for Top 25 vs. All Occupations (2002-2014)[a]



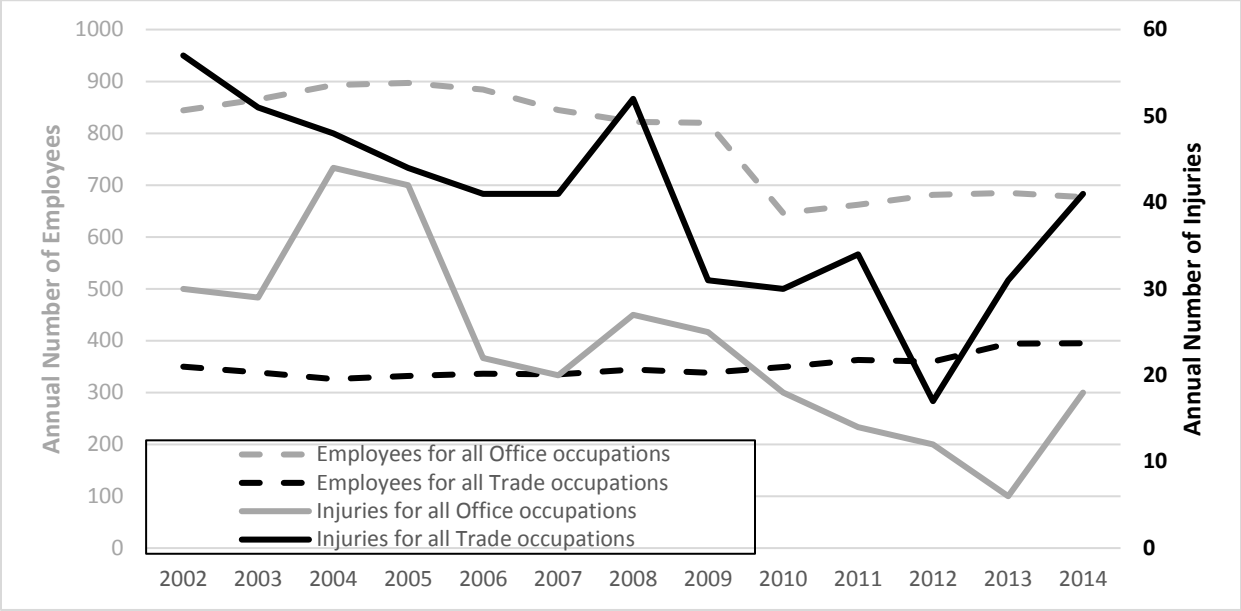
Source: USBR PNR SMIS data

[a] The occupations within the Top 25 changed after the 2009 restructure, therefore, the two graphs were separately produced but are viewed in tandem.

Craft/Trade vs. Office Worker

When Craft/Trade and Office workers are compared in terms of numbers of employees and recordable injuries, the Craft/Trade workers have a higher recordable injury incidence than office workers, but represent significantly fewer number of employees (Figure 7).

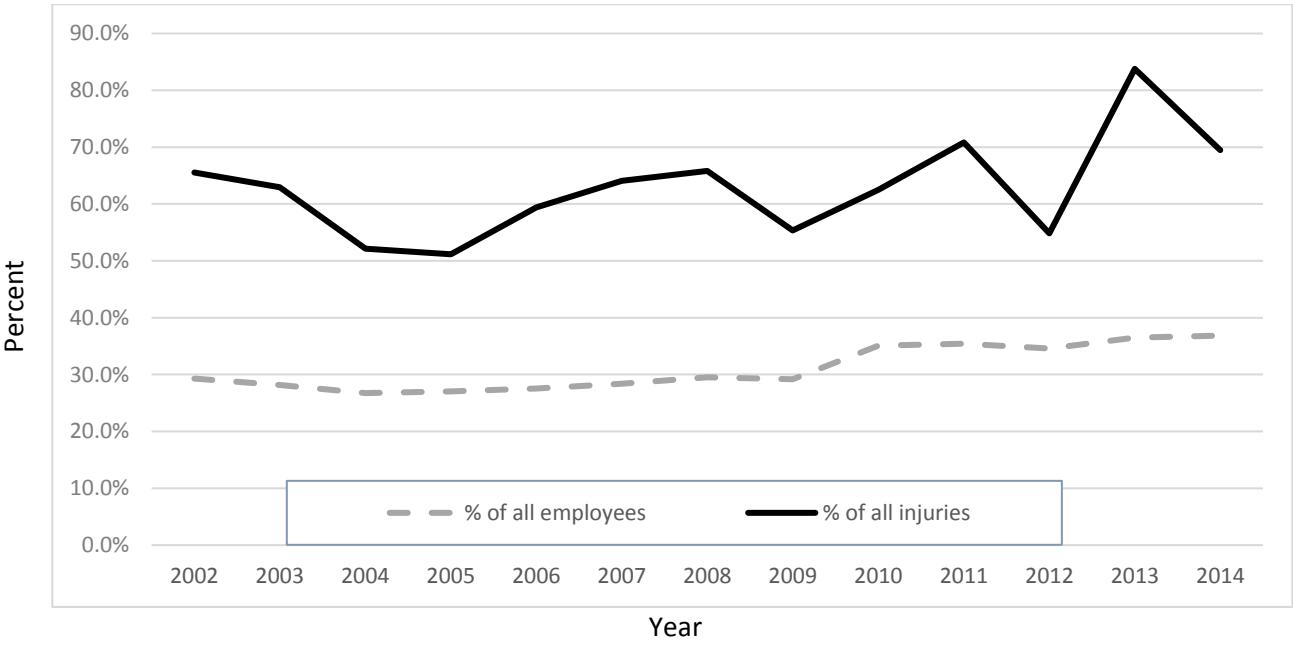
Figure 7. Annual Number of Employees and Recordable Injuries by Occupation Type (2002-2014)



Sources: USBR PNR HR Alpha-Org Roster, and USBR PNR SMIS data

During the 2002-2014 time period, Craft/Trade workers accounted for approximately 30% of the PNR workforce (Figure 8) but for almost 65% of recordable injuries, and their injury proportion rose to more than 80% in 2013.

Figure 8. Craft/Trade Employees as Percent of All Employees and Recordable Injuries (2002-2014)



Sources: USBR PNR HR Alpha-Org Roster, and USBR PNR SMIS data

When the type of worker is examined within the most injurious occupations, approximately half (58%) of the recordable injuries from the Top 25 injurious occupations were among Craft/Trade employees, and this

proportion is similar for the Top 10 occupations (50%). But when limited to the Top 4 injurious occupations, 100% of the injuries are among Craft/Trade employees.

Table 4 lists the Top 10 injurious occupations from 2010-2014. Six of the occupations are Craft/Trade, three are Office, and one is the guards at Grand Coulee. These occupations are some of the most hazardous in each Area.

Table 4. Ten Occupations[a] with Highest Average Annual Injuries Rank-Ordered by Area (2010-2014)

OccCode	Occupation Title (n=10)	Avg Annual Injuries (2010-2014)	Rank Order of Avg Annual Injuries by Area		
			CCAO	GCPO	SRAO
5352	Industrial Equipment Mechanic / Hydromechanic	9.2	7	1	2
2810	Electrician	5.4	3	2	5
4749	Maintenance/Facilities Worker / Utilityman	5.4	2	8	1
4742	Utility Sys. Repair-Oper./Craftsman	3.4	1	--	--
0085	Guard	2.8	--	3	--
5407	Ctrl Center/Ppt Operator / Powersystems Journeyman	2.2	5	4	7
0303	Administrative Support Assistant/Clerk/Office Aid	1.4	--	5	8
0404	Biological Science/Tech	1.2	--	--	3
0810	Civil/Hydraulic Engineer	1.0	6	--	9
5301	Powerplant Maint Workleader / O&M Journeyman	0.8	11	--	4

[a] Shading denotes an occupation that is not Craft/Trade.

UNC divided the Top 10 occupations into Craft and non-Craft/Trade occupations and calculated an injury distribution ratio (i.e., average annual injuries divided by average annual employees) to identify which Areas experienced a disproportionate number of injuries given the size of their workforce (i.e., a ratio greater than 1.0).

For the six Craft/Trade occupations in the Top 10, the Columbia-Cascades Area had an injury incidence that was disproportionate to their number of Craft/Trade employees (Table 5).

Table 5. Number of Recordable injuries and Employees by Area for Six Craft/Trade Occupations with Highest Injury Occurrence (2010-2014)

Location	Avg Annual Injuries[a]		Avg Annual Employees		Injury Distribution Ratio[b]
	N	%	N	%	
PNRO	0	0%	0	0%	--
CCAO	8.8	33%	45.6	16%	2.1
GCPP	13.8	52%	191.8	69%	0.8
SRAO	3.8	14%	41.8	15%	0.9
Total	26.4	99%	279.2	100%	--

[a] Injury proportions do not include visitor injuries.
[b] Injury Distribution Ratio: % injuries divided by % employees. The distribution is disproportionate when ratio > 1.0.

For the four non-Craft/Trade occupations in the Top 10, the Snake River Area had an injury incidence that is disproportionate to their number of non-Craft/Trade employees (Table 6).

Table 6. Number of Recordable injuries and Employees by Area for Four non-Craft/Trade Occupations with Highest Injury Occurrence (2010-2014)

Location	Avg Annual Injuries[a]		Avg Annual Employees		Injury Distribution Ratio[b]
	N	%	N	%	
PNRO	1.0	16%	49.6	34%	0.5
CCAO	0.6	9%	17.6	12%	0.8
GCPO	3.6	56%	64.0	45%	1.2
SRAO	1.2	19%	12.4	9%	2.1
Total	6.4	100%	143.6	100%	--

[a] Injury proportions do not include visitor injuries.
[b] Injury Distribution Ratio: % injuries divided by % employees. The distribution is disproportionate when ratio > 1.0.

Agency Reports

When the Safety Culture Taxonomy was used to code a selection of PNR safety assessment reports, the results demonstrated what parts of the safety culture were assessed (Table 7). Across all reports, the most findings (79.0%) were about organizational aspects of PNR's safety culture, with the combination of psychological and behavioral findings representing only 18.5% of all report findings. Within the organizational findings, the environmental (40.7%) and management (23.8%) aspects received most attention.

The Safety and Management Evaluation (SME) reports had the largest proportion of organizational findings (85.7%) which were mostly represented by management (54.3%) and systems (21.4%) findings. Similarly, the reports by OSHA focused mainly on the organizational aspects of safety culture (89.8%), with the environmental (64.3%) receiving most attention, and systems (13.3%) and management (12.2%) receiving less attention.

PNR's incident investigation reports identified fewer organizational findings (60.0%) and the most behavioral findings (35.0%) compared to SME and OSHA reports.

Table 7. Proportion of PNR Safety Assessment Findings by Report Type and Safety Culture Construct Type (2010-2014)

Safety Construct Taxonomy	PNR Author		Other Author	All Reports (n=19)
	SME Reports (2011-2014) (n=3)	Incident Reports (2013) (n=2)	OSHA Reports (2010-2014) (n=13)[a]	
Psychological	**5.7%**	**0.0%**	**0.0%**	**1.6%**
Behavioral	**8.6%**	**35.0%**	**8.2%**	**16.9%**
Organizational[b]	**85.7%**	**60.0%**	**89.8%**	**79.0%**
Context	*5.7%*	*1.3%*	*0.0%*	*2.0%*
Systems	*21.4%*	*3.8%*	*13.3%*	*12.5%*
Management	*54.3%*	*11.3%*	*12.2%*	*23.8%*
Environment	*4.3%*	*43.8%*	*64.3%*	*40.7%*
N/A	0.0%	5.0%	2.0%	2.4%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**

[a] Only 13 of 27 OSHA reports were complete enough to be included in this analysis.
[b] The organizational aspects of safety culture are further characterized by four major sub-groups (i.e., context, systems, management, environment).

When the PNR reports' safety findings were classified by type (i.e., negative, positive, mixed), the report authors identified more negative findings (61%) than positive (29%) (Table 8). Two exceptions to this pattern were the Snake River SME report (40% positive and 40% negative findings) and the PN Region SME (67% positive findings).

When each negative finding was assessed for a corresponding or addressing recommendation, on average 17% of the negative findings lacked any recommendation or articulated idea for improvement. The Pinto Dam incident report had the largest proportion (56%) of negative findings without recommendations.

Table 8. Number and Type of Safety Findings by Report and Percent of Negative Findings Lacking a Recommendation

Report Name	Type of Safety Finding			Sub-Total	Percent of Negative Findings Lacking a Recommendation
	Negative	Mixed	Positive		
PN Region SME (2011)	5 (28%)	1 (6%)	12 (67%)	18 (100%)	0
Grand Coulee SME (2014)	32 (76%)	8 (19%)	2 (5%)	42 (100%)	28% (n=9 out of 32)
SRAO SME (2014)	4 (40%)	2 (20%)	4 (40%)	10 (100%)	0
Pinto Dam SAI report (2013)	16 (76%)	3 (14%)	2 (10%)	21 (100%)	56% (n=9 out of 16)
JW Keys SAI report (2013)	30 (58%)	1 (2%)	21 (40%)	52 (100%)	3% (n=1 out of 30)
Total	**87 (61%)**	**15 (10%)**	**41 (29%)**	**143 (100%)**	**AVG = 17%**

Section 3: Project Year 2 – Additional Data Collection and Analysis

METHODS (YEAR 2)

In Year 2, UNC sought to interview employees in the 10 most hazardous occupations and to compare employee perceptions to the newly released reports from the U.S. Bureau of Reclamation's 21 safety action teams.

UNC Interviews

Because PNR had been repeatedly surveyed in recent years, they requested that UNC not conduct any surveys as part of the project's data collection process. Therefore, during September-October 2016, UNC conducted 73 on-site individual and group interviews with PNR employees in each of the Areas and at the regional headquarters. Interviews were conducted during the normal scheduled workday for each group of employees, except for Grand Coulee control center operators who were paid overtime to come into work for the interview (i.e., usually only 1-2 are on duty at a time). From October 2016 through April 2017, UNC conducted 23 telephone interviews with safety staff and management. The 96 interview sessions explored employees' jobs, work environments, management and coworker dynamics, and perceptions of various aspects of the safety culture. Employee participation was not mandatory. PNR sent an employee-wide announcement about the interviews and followed-up with personal invitations from staff assigned to recruit for each Area Office, Field Office, or facility. The University of North Carolina Internal Review Board (IRB) approved the project's interview process as presenting minimal risk to human subjects.

The literature search from Year 1 provided extensive background for developing a semi-structured interview guide for use in Year 2. In addition, UNC conducted several informational interviews with key staff to learn more about the history of PNR Areas and facilities, and some of the dynamics when key leadership were replaced. This information helped to shape the contents for five interview guides that were developed for separate groups of employees that would be interviewed (i.e., Craft/Trade, Foreman, Supervisor, Safety Staff, Manager). The draft interview guides contained both open-ended questions and closed-ended prompts (should participants fail to understand a question). Draft versions were circulated to project contacts to gain feedback and suggestions. To ensure utility and efficiency, all interview guides were additionally revised after their first day of use.

To identify employees to recruit for interviewing in each Area or Field Office, UNC used the employee lists created at the end of Year 1. Sampling frames were developed consisting of employees working at nearby facilities. Each sampling frame was stratified by employee type (i.e., Craft/Trade, Foreman, Supervisor, Safety Staff, Manager). Each sample strata was randomized to develop interview recruitment lists. The interview recruitment lists were then sent to the project's point of contact at each Area or Field Office, and their staff used the lists to recruit participants for the interviews. Specifically, employees were recruited in the same order that they were printed on the list, and the recruiter stopped extending invitations when they had filled all the interview seats allocated for the timeslot.

Interviews were conducted on-site at PNR facilities, and drew participants from the nearby work area, with a few being paid to travel about 1-2 hours to participate in the interview. Interviews were conducted in private rooms with all windows and doors closed. Only UNC and the recruited participants were in the room. Participants sat in a semi-circle around a table facing the UNC team. No audio or video recording was used, and each interview began by explaining the purpose of the project, the confidentiality granted to each participant, and how the information would be analyzed and reported (i.e., aggregate form only). Each participant was provided with a summary sheet explaining the project and how the confidentiality of their responses would be protected by UNC (Appendix C). Participant questions were invited prior to the interview start.

Of the 1,132 PNR employees in 2016, UNC interviewed 167 (15% of the workforce). Table 9 demonstrates the representativeness of the UNC sample by PNR location. At a minimum, UNC wanted their sample to represent the same proportion working in each Area. But given the relatively small numbers of employees working at the visited facilities in CCAO and SRAO, UNC over-sampled to ensure enough diversity of perspective was heard (for example, CCAO represents 14% of the PNR workforce, and UNC exceeded that percentage by recruiting 23% of their interviews from CCAO). Because Grand Coulee represents 45% of the PNR workforce, UNC maintained that proportionate representation for their interviews.

Table 9. Number and Percent of PNR Employees Participating in the 96 Interview Sessions

PNR Workforce by Location			***UNC Interview Sample***	
Location	*Number of Employees*	*Percent of Employees*	*Number of Employees Interviewed*	*Percent of Employees Interviewed*
CCAO	162	14%	39	23%
GCPO	504	45%	75	45%
SRAO	144	13%	40	24%
PNRO	322	28%	13	8%
TOTAL	**1,132**	**100%**	**167**	**100%**

When designing the interview sample, UNC sought to interview more Craft/Trade workers than any other type of employee because they represented 65-80% of recordable injuries. Table 10 presents the interview sample of 167 employees categorized by the type of employee, and it shows that 43% of those interviewed were Craft/Trade workers.

Table 10. Interview Sample by Employee Type (n=167)

Position Type	**% of Interviewees**
Craft/Trade	43% (n=71)
Manager	16% (n=27)
Foreman	11% (n=19)
Guard	9% (n=15)
Safety Staff	8% (n=14)
Supervisor	7% (n=11)
Office	6% (n=10)
TOTAL	**100% (n=167)**

To provide an external "benchmarking" perspective about safety culture practice in high-hazard industries, during the Fall 2016 and Spring 2017, UNC contacted governmental and private organizations with either similar industrial scope or similarly hazardous occupations. Some of the benchmark sources were from other U. S. Department of Interior entities, and some were specifically mentioned in safety culture literature or media stories. Of the twelve people contacted, eight agreed to be interviewed by telephone (Table 11).

Table 11. Sample for Benchmark Interviews (n=8)

Organization	**Type of Organization**	**Interview Status**	**Number of Interviews**
U.S. Bureau of Land Management	Government	Agreed	1[a]
U.S. Fire Administration	Government	Agreed	2
U.S. Forest Service	Government	Agreed	3
U.S. Army Corps of Engineers	Government	No Reply	--
Tennessee Valley Authority	Government	No Reply	--
MidWest Generation (MWG)	Private	Agreed	1
Central Hudson Gas & Electric Corp	Private	Agreed	1
Duke Energy	Private	No Reply	--
Cox-Schepp Construction, LLC	Private	No Reply	--
TOTAL			**8**

[a] Additional informal interviews were conducted to learn about specific program aspects.

None of the interviews were audio recorded, and participants were guaranteed confidentiality for their statements during the interview. Two members of the UNC team jointly conducted each interview and typed people's responses to questions. Interview notes were consolidated to produce almost-verbatim interview transcripts (Table 12).

Table 12. Interview Data Used in Year 2 of the UNC Project (2016-17)

Description	**Data Type**	**Source**
a. Site-visit interviews with PNR employees (2016)	Interview transcripts (n=73)	UNC
b. Telephone interviews with PNR employees (2016 – 2017)	Interview transcripts (n=23)	UNC
c. Telephone interviews with benchmark organizations (2017)	Interview transcripts (n=8)	UNC

Interview transcripts were analyzed using a grounded theory approach to qualitative research (Glaser and Strauss, 1967; Strauss and Corbin, 1990). During this process, passages of interview text were assigned "codes" using generative-thematic coding methods. One passage of text could receive multiple codes including: demographic information about the type of worker, facility, Area; response theme (as many as required to capture all the explicit and implied meanings in the response), and response negativity/positivity. NVivo 11 coding software (QSR International, 2016) was used to code text, matrix the relationships between codes, and produce quantitative patterns across codes. UNC tracked specific patterns within each theme: i) variation by Area (CCAO, GCPO, SRAO, PNRO), and ii) variation by employee type (Craft/Trade worker, foreman, supervisor, safety staff, and manager). Important pattern variations were reported in terms of how much they differed from the regional average.

USBR 21 Team reports

During the second year of the project (2016), UNC received reports from the 21 Reclamation safety action teams that had begun their investigations into safety and safety culture in 2014. One of the 21 team projects included a Reclamation-wide employee survey about safety culture (Team #14), and UNC was provided the dataset to conduct additional analyses (Table 13). PNR provided the largest number of survey participants (n=721) and the largest response rate at 24% (Safety and Occupational Health Action Plan Team 14, 2016).

Table 13. Agency Reports Used in Year 2 of the UNC Project (2016-17)

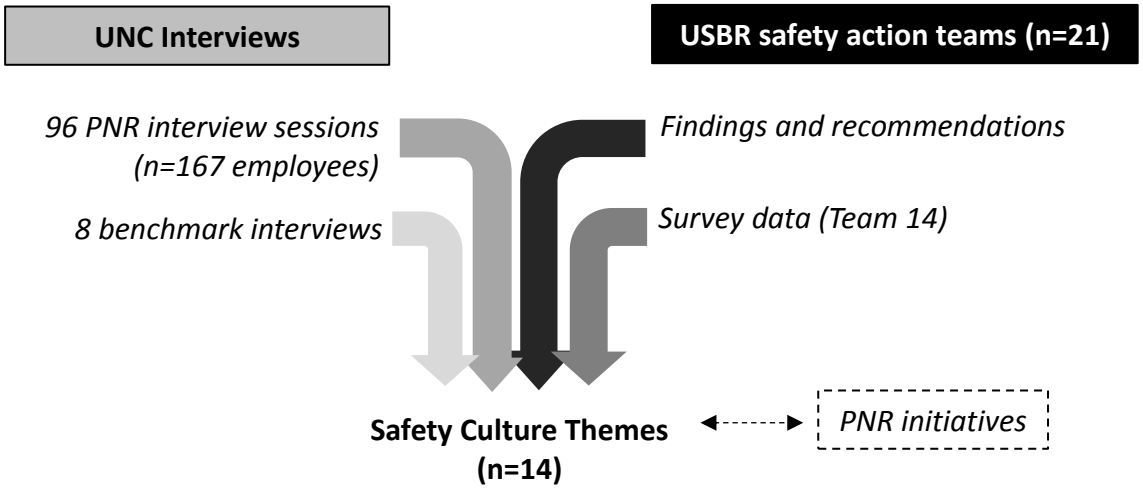
Description	Data Type	Source
1. USBR 21 Safety Action Team reports (2016)	Report (n=21)	USBR
2. USBR Safety Action Team #14 survey (2016) a. N=721 responses (24% response rate)	Dataset	USBR

UNC coded each report's findings and recommendations to the major theme topics that emerged from the UNC interviews. By using similar theme topics, the theme results from the reports could be overlapped with the results from the interviews. This process "triangulated" the information (Rice & Ezzy, 1999; Thurmond, 2001) to compare and enrich the findings from multiple perspectives about PNR's safety culture and suggestions for improvement (Figure 9).

UNC also conducted additional analysis with the USBR Team #14 dataset (i.e., employee perceptions of safety culture). The quantitative data from the PNR employees were extracted and reanalyzed to produce PNR-specific responses based on employee type (i.e., federal wage, general schedule, and senior executive). This analysis provided a proxy perspective for Craft/Trade vs. other jobs in the region, and the results could be triangulated against the UNC interview findings, especially when patterns varied for Craft/Trade employees (Figure 9).

The Team #14 dataset also included question #10.4, "How would you improve your workplace's safety program?" Although this question was not specifically focused on safety culture, many of the narrative responses articulated the aspects of safety culture that needed improvement. UNC qualitatively analyzed the narrative responses to generate themes using the same coding process for the interviews, and then triangulated those findings with the others (Figure 9).

Figure 9. Process to Triangulate Data Sources to Develop the Safety Culture Themes



During the interview process, UNC heard about multiple initiatives planned for the region that could positively influence safety culture. The initiatives were linked to the major theme areas which they seemed likely to influence (Figure 9).

Methodological Strengths

UNC received excellent cooperation from PNR staff during both the process of securing relevant documents and materials from the agency, and also during the interview recruitment process. The recruitment process worked well and all interviews were implemented as planned during 3 site visits covering 3 PNR areas. Some participants complimented the comprehensive range of safety culture topics addressed during the interview. The open-ended questions seemed to function well as the starting point for participants to build upon one another's perceptions and opinions. During each interview, UNC endeavored to maintain extensive eye contact with the participants in order to show respect and visible attentiveness as they spoke.

The interview selection process gained broad representation from the 10 hazardous occupations, and the chain of management above those front-line positions. The process also gained almost complete representation of the safety staff working in each Area and at the regional office including an April 2017 interview with the newly hired Safety Manager at Grand Coulee.

In general, interview participants appeared eager to talk for the full 60 minutes, with some requiring additional time. Only two people out of 167 seemed reluctant to speak and responded minimally, but since they were each in a group interview, the remaining participants conveyed the necessary information. Participants expressed appreciation for UNC's preparation to become familiar with the facilities, the job tasks, the types of equipment used, and some of the organizational history within each facility.

Methodological Limitations

During Year 1, only 13 of the 27 OSHA reports could be obtained from either PNR of the state OSHA office. In some cases, the reports could not be found, and in other cases they had been expunged from the electronic system.

UNC received a de-identified SMIS database of PNR employee injuries (i.e., it did not include employee names or other personal identifiers such as injury severity or body part injured).

For the sake of efficiency and comprehensiveness, a semi-structured interview guide was used, and it asked participants to reflect on many aspects of safety culture and the safety management system. The interview process might have elicited more critical thinking than positive reflections. However, UNC observed that employees did routinely offer positive feedback about regional operations or efforts.

Safety staff were interviewed in each Area, except for Columbia-Cascades where the employee became unavailable during the site-visit and afterward failed to return UNC's repeated attempts at telephone contact.

Each interview session generally included multiple workers (i.e., ranging from 1 to 6), therefore, it followed more of a focus group format where each participant did not necessarily respond to every question. Instead an open-ended question was asked of the group, and they would discuss their perceptions and opinions with the

interviewers and with each other. Due to administrative complications, three of the 96 interviews had to combine a foreman with the Craft/Trade workers, and one interview included a supervisor with the workers. Although this was not according to the original recruitment plan, UNC noted that in these cases that the participants exhibited a close working relationship and could dialogue about the questions.

RESULTS (YEAR 2)

The analysis produced 14 safety culture themes which are presented in this section in three theme groups: administrative culture, management/employee culture, and components of the safety management system (SMS).

Each safety culture theme is presented with a summary table that demonstrates the level of alignment between the UNC findings and the other data related to the theme (i.e., the results of the data triangulation process). The other data sources either provide nothing relevant, or they reinforce the UNC findings, and/or they provide additional insight that enhances the UNC findings. Each summary table also lists the current PNR safety-related initiatives which have the potential to contribute to improving that safety culture theme.

After each summary table is a detailed report of findings from all the data sources for that safety culture theme.

A. Administrative culture

THEME #1: Hiring of Employees

Evidence across Data Sources (Triangulation)

UNC Summary Findings:	*Hiring of Employees*	
Almost half of interviewed Craft/Trade and supervisors want hiring to be based on skill level, with some wanting PNR to rigorously screen-out the less qualified applicants. Craft/Trade (especially at Grand Coulee) interviews were the most concerned that new hires lack sufficient skills to do their jobs safely. Regional Office interviews suggest that new hires do have requisite minimum qualifications. When discussing position descriptions, some supervisors want to include specialized technical requirements, and some high-level regional managers want to standardize them. More than 25% of interviews were concerned that the hiring process for managers does not seem to follow a rigorous skills-based standard, but rather "promotes its problems" rather than dismissing them. Suggestions included requiring basic competencies like interpersonal skills and hydropower technical skills. Some interviews discussed challenges getting positions classified to merit competitive salaries. Discussions about the hiring process led to reflections about working with Human Resources, and requests for more support and guidance for writing of position descriptions, developing interview questions, conducting interviews to reveal technical competency, and improving background reference check procedures. The suggestions could inform HR's recent outreach efforts to educate supervisors and interested employees about the regulatory complexities of hiring.		
Other Data Related to Theme		
Data Source	**Alignment w/UNC Findings**	**Relevant Findings**
UNC Benchmark Interviews (n=1 of 8)	Enhances	When hired, military veterans bring experience with redundant safety systems, and this can positively influence safety culture.
USBR 21 Team Reports (n=2) *(#1, 3)*	Enhances	Safety precautions are a routine part of every job as stipulated in policies and business practices, therefore job descriptions do not necessarily need revision to include safety duties. USBR Safety Council should develop a position description for the CDSR role.
USBR Team 14 Survey *(PNR compared to USBR, n=no questions)*	N/A	N/A
USBR Team 14 Survey *(PNR narrative responses, n=6 of 201 comments)*	Reinforces	PNR's hiring process is ineffective at hiring qualified applicants.
Relevant PNR initiatives	Could help to address	• HR outreach to Areas to describe hiring process and highlight how they can assist • PNR's EEO staff are identifying whether and how to enhance the core/professional competencies for select positions (and these will then link to training opportunities) • Leadership training is in development • MESH or other supervisor training(s) are in development

Theme Data

A) UNC Interviews

Almost two thirds of interviews discussed the hiring process for PNR employees and explored issues about applicants' skill-level, the effectiveness of applicant screening, the impact of position descriptions, and the role of the Human Resources staff (Table 14).

Table 14. Hiring of Employees (UNC Interviews, n=96)

	PNR Percent	Important Differences across PNR[a]	
		Area[b]	Position[c]
Hiring for skill level	36%	RO (69%)	CT (45%), X (50%)
1. Need to screen-out unqualified applicants	20%	CC (5%), RO (54%)	
2. New hires should already have necessary skills	17%	GC (23%), RO (8%)	CT (35%)
3. New hires do not already have necessary skills	14%	GC (23%), RO (8%)	CT (23%), F (27%)
4. New hires do already have necessary skills	8%	RO (23%)	X (20%)
Position description	26%	GC (35%), RO (54%)	M (57%), X (10%)
Hiring and promotion of managers	27%	GC (39%)	
1. Mgmt not hired/promoted based on skill level	14%	GC (26%)	CT (23%)
Comments about Human Resources Department	24%	SR (37%), RO (54%)	M (48%), SS (8%)

[a] Blank cell means no important differences to report

[b] CC = Columbia-Cascades area, GC = Grand Coulee, SR = Snake River area, RO = PN regional office

[c] CT = craft/trade, F = foremen, M = managers, SS = safety staff, X = supervisors

Level of Skill for New Hires. Over one third of interviews (45% of Craft/Trade and 50% of supervisors) discussed the need for PNR to hire applicants based on skill level, with 26% of Craft/Trade and 20% of supervisors wanting PNR to more rigorously screen-out unqualified applicants. Approximately 25% of the Grand Coulee interviews, and 35% of Craft/Trade interviews, proposed that new hires should already have the requisite technical skills when they start their jobs. At Grand Coulee, the same proportion do not believe new hires have those skills when they begin their jobs. Craft/Trade workers in all Areas, but especially at Grand Coulee, reported that insufficiently skilled new hires become safety liabilities in the workplace. This perception of insufficiently skilled new hires was not shared by the Regional Office, where an equal proportion (23%) of interviews believed that new employees do have the necessary technical skills for their jobs, because that is how the hiring process works (i.e., they met at least the minimum qualifications).

Position Descriptions. About one quarter of interviews suggested that PNR position descriptions are not specific enough to reliably convey the skill demands of some of the more highly skilled Craft/Trade jobs. Several managers were concerned that position descriptions are not being written by the appropriate personnel, and that collaborative development might be necessary. While supervisors seemed to argue for more specialized position descriptions, some of the high-level regional management were considering how to standardize position descriptions because they lack consistency across the entire region. Some suggested updating position descriptions during the annual performance review process. A few interviews suggested including both general and specific safety duties in every position description, and others disagreed, stating that safety is already written into policies, business practices, and performance standards. Several interviews with supervisors and with Regional Office managers suggested that supervisors should be trained to play a larger role in the hiring process (for example, learning to write more technically-specific position descriptions, asking more technically-specific interview questions, or designing technical questions to be used when checking applicants' references).

Hiring of Managers. More than a quarter of all interviews discussed their concern with the hiring and promotion of managers (with the most discussion in Grand Coulee – 39% of interviews). Craft/Trade workers and Grand Coulee interviews expressed the opinion that managers are not held to a skill-based standard when hired and promoted. Some workers and supervisors suggested that PNR "promotes its problems" rather than dismissing them. Employees across the region identified basic management competencies that PNR should recruit for its managers, including "people skills" and experience/skill in at least one trade required for hydro-power generation. A few high-level managers described PNR's inability to create some new managerial positions at specific GS levels to ensure salaries that can compete with other government agencies, especially for jobs in remote locations.

Human Resources. When discussing the actual hiring process, approximately 25% of interviews specifically discussed their interactions with and opinions of the Human Resources (HR) representatives at multiple levels of the organization. Regional Office comments were usually positive/neutral; and more critical observations came from Craft/Trade, foremen, supervisors, and some managers. The critical comments focused on the need for HR to: i) provide more support and guidance for enhancing position descriptions, ii) help improve the bank of interview questions, iii) train supervisors in how to interview job applicants to reveal their technical competency, and iv) improve the process for background reference checks. The HR manager discussed his department's awareness of some of these concerns, and described how HR staff have been conducting outreach to educate supervisors and other employees, and to provide basic orientation to the regulatory complexities which PNR must navigate when hiring.

B) Benchmark Interviews (n=1 of 8)

1. [New hires] with military experience might have experienced redundant safety systems that can bring a level of expectancy and awareness to help transform the safety culture.

C) Findings from the USBR 21 Teams (n=2 of 21)

Two of the teams discussed position descriptions. One team (#1) revealed that it had purposefully decided not to make a recommendation on the matter. Another team (#3) recommended that model language be drafted for a CDSR position description.

1. Team 1 – Roles and Responsibilities
    a. Decided not to recommend adding three paragraphs about safety to position descriptions because employees are required to follow all safety precautions as a regular and recurring part of their job duties (pg 1).
2. Team 3 – Survey for Effective Use of SOH Staff
    a. USBR Safety Council should collaborate with HR to develop model language for a CDSR position description including duties, % time for each duty, training required within the Individual Development Plan (pg 5).

D) How compare to Team 14 survey opinions?

Team 14 Survey – Quantitative and Likert-Scale Questions

The Team 14 survey did not specifically inquire about the hiring process.

Team 14 Survey - Question 10.4: *"How would you improve your workplace's safety program?" (UNC analysis, n=6 of 201 comments, from 161 PNR respondents)*

Narrative responses from PNR suggested that the safety program could be improved by investigating and adjusting the hiring process, especially where employees regard it with suspicion.

1. Improve the hiring system to ensure competent safety staff and leadership (n=3).
2. Stop hiring practices that are not based on qualifications (n=2).
3. Provide technical skill training (n=1).

E) Relevant PNR initiatives

1. HR outreach to Areas to describe hiring process and highlight how they can assist
2. PNR's EEO staff are identifying whether and how to enhance the core/professional competencies for select positions (and these will then link to training opportunities)
3. Leadership training is in development
4. MESH or other supervisor training(s) are in development

THEME #2: Procurement Process

Evidence across Data Sources (Triangulation)

UNC Summary Findings:	*Procurement Process*	
Almost 25% of foremen, supervisors, and managers who must engage with procuring equipment, parts, supplies, and materials, prefer using their Reclamation credit card whenever possible. If they must surpass the credit card limit, they approach the Procurement process with hesitation because it is perceived as difficult, slow, and too frequently produces lower-quality goods (due to federal contract preference for lowest bid and small business vendors). Some facilities believe they have received poor customer service from Procurement staff. Therefore, multiple foremen and supervisors strive to develop "workaround fixes" so they can avoid Procurement. In some locations, they described an accumulation of substandard repairs that now render certain equipment or facility conditions to be unsafe. PNR regional management is aware of the need for Procurement to enhance their customer service practice. From their perspective, Procurement gets swamped with requests in the Spring, which results in processing delays and, ultimately, frustration back at the facilities.		
Other Data Related to Theme		
Data Source	**Alignment w/UNC Findings**	**Relevant Findings**
UNC Benchmark Interviews (n=none of 8)	N/A	N/A
USBR 21 Team Reports (n=2) *(#2, 10)*	Reinforces and Enhances	Reclamation regions, areas, and/or facilities need to proactively plan for equipment and repair needs so the procurement process can align with project timelines and work scheduling. Reclamation needs a process to review all acquired materials for potential health hazards and provide awareness training to employees about purchasing, storing and using such hazardous materials.
USBR Team 14 Survey *(PNR compared to USBR, n=2 questions)*	Reinforces	All the upper management, but only about 75% of Craft/Trade and lower management, believe that workplace budgets are adequate for safety equipment, and that the necessary PPE is provided for job safety.
USBR Team 14 Survey *(PNR narrative responses, n=3 comment)*	Reinforces	PNR should provide necessary PPE to workers.
Relevant PNR initiatives	Could help to address	• MESH or other supervisor training(s)

Theme Data

A) UNC Interviews

About half of interviews discussed their experiences with the procurement of equipment, supplies, and materials for facility and equipment repair and maintenance (Table 15).

Table 15. Procurement Process (UNC Interviews, n=96)

	PNR Percent	Important Differences across PNR[a]	
		Area[b]	Position[c]
Interactions with Procurement employees	26%	GC (45%)	
Procurement process requirements	17%	GC (29%), SR (3%), RO (31%)	

[a] Blank cell means no important differences to report

[b] CC = Columbia-Cascades area, GC = Grand Coulee, SR = Snake River area, RO = PN regional office

[c] CT = craft/trade, F = foremen, M = managers, SS = safety staff, X = supervisors

Almost 25% of interviewed foremen, supervisors, and managers (most of them at Grand Coulee) were concerned with the procurement process and observed that it too frequently delayed their work schedules. Employees who critiqued the procurement process complained that the USBR credit card limits for purchases are too low, and, therefore, work groups would have to engage with the Procurement process to acquire the needed parts, supplies or materials. Many described the Procurement process as too slow, not responsive to their requests and needs, and resulting in low quality or inappropriate purchases. Grand Coulee interviews frequently linked Procurement delays to work progress delays. Multiple workgroups described their efforts to develop "workaround fixes" so they would not have to use the Procurement process. They also observed, however, that years of such workaround fixes had resulted in substandard repairs for some equipment or facility components, and those conditions were now considered unsafe.

Several interviews described the federal contracting process as unrealistic, and complained that Procurement staff insist on PNR facilities meeting the standardized purchasing expectations. For example, insisting on three bids when only one vendor exists for the product; demanding detailed specifications when none currently exist or the current specifications from the company don't match Procurement expectations. Supervisors complained about the automatic awarding of contracts to the lowest bidders, and the result usually being poorer quality products or equipment. They also complained that Procurement focuses on contracting with small business vendors who often cannot produce fast enough to meet the order schedule.

Supervisors and some managers perceive the Procurement staff as being less responsive than they should be to the facility staff they serve. Common complaints among supervisors are that Procurement does not understand the Reclamation work and job needs; that the Procurement timeline is out of sync with work plan timelines; and that Procurement staff work reactively instead of proactively.

Regional managers commented on the need for Procurement to become more customer service oriented, but also suggested the need for PNR to improve the understanding at all facilities of the Procurement process and timeline. In general, the Procurement staff receive too many of their requests in Spring, and each must proceed through a carefully regulated process. This creates a backlog, which can negatively affect facility work schedules. If the procurement requests could be planned out for submission throughout the year, it would spread out the demand across many months. One suggestion was for PNR to proactively initiate communication with each facility to encourage early planning for purchases.

B) Benchmark Interviews (n=none)

No benchmark interviews specifically addressed the procurement process.

C) Findings from the USBR 21 Teams

Team 2 – Implement Safety Policy (ANSI Z10)

1. Develop strategic plan to project out for equipment and staffing needs to support routine operations (pg A6).

Team 10 – Acquisition Safety Review

1. Create USBR process to review for safety or occupational health risk hazards during the acquisition process for equipment, products, materials, chemicals, etc. (pg 8).
2. Develop and provide awareness training courses to employees about purchasing items that may cause a safety hazard. This training could include an overview of OSHA, RSHS requirements, guides, lists, and references that are available (pg 9).

D) How compare to Team 14 survey opinions?

Team 14 Survey – Quantitative and Likert-Scale Questions

About 70% of FW and GS workers believe PNR provides an adequate budget for safety equipment, with almost 80% of those employees agreeing that the agency provides the necessary PPE to work safely (Table 16). For each question, 100% of the responding senior executives believe the budgets and necessary PPE are provided and adequate.

Table 16. Procurement Process (Team 14 survey)

USBR Team 14 Survey Question		**Responses Included**	**PNR** (n = 721)	**USBR** (n = 3083)	**Employee Type**[a,b]
Q3.4_8	My workplace has adequate budget for safety equipment.	Agree	71%	67%	SE (100%) GS (71%) FW (71%)
Q3.4_9	My workplace has the personal protective equipment I need to do my job safely.	Agree	82%	79%	SE (100%) GS (83%) FW (79%)

[a] UNC analyzed the survey raw data to produce PNR-specific proportions for employee types.
[b] SE = Senior Executive; GS = General Schedule; FW = Federal Wage.

Team 14 Survey - Question 10.4: *"How would you improve your workplace's safety program?" (UNC analysis – n=3 of 201 comments, from 161 PNR respondents)*

The gap is reflected in three narrative responses that PNR needs to provide personal protective equipment (PPE).

1. Provide PPE (n=3)

E) Relevant PNR initiatives

1. MESH or other supervisor training(s) could include guidance for procuring equipment, parts, materials and supplies.

B. Management/Employee culture

THEME #3: Management Relationship with Workers

Evidence across Data Sources (Triangulation)

UNC Summary Findings:	*Management Relationship with Workers*	
Managers and workers differed in their opinions about the level of knowledge and skill needed by managers to guide operations and effectively manage employees. Workers wanted all levels of management to visit worksites to meet employees and become more familiar with their jobs and working conditions. The managers who reported visiting worksites might over-estimate the effectiveness of their interactions, especially if they visit for other purposes than building relationships. Workers wanted management to build relationships with them, respect their knowledge and experience, demonstrate support, and treat workers first as people. Such actions inspire commitment and dedication to PNR and to safety. Some managers have reputations for acting with integrity; others do not. Workers observed the lack of integrity through some managers' duplicitous actions, lack of follow-through, arrogance/bullying, or evident lack of experience. When individual managers or supervisors do not act with integrity, the effect is corrosive on that professional's credibility among the workforce who then downgrade their trust for that manager or supervisor. Negative observations about one manager can also erode trust in management more generally. Integrity-building behavior was highlighted as a purposeful investment by those managers who prioritize visiting employees, listening, developing relationships, and ensuring follow-through. Middle management (supervisors through O&M managers) might seem less responsive or transparent when struggling to align employee needs with agency goals and leadership directives.		
Other Data Related to Theme		
Data Source	**Alignment w/UNC Findings**	**Relevant Findings**
UNC Benchmark Interviews (n=7 of 8)	Reinforces and Enhances	Management needs to visit the workforce and show that they value the workforce as people, trust and comprehend workers' knowledge and experience, and then secure and allocate the necessary resources to ensure they can work safely. Management must "walk the talk" and follow the rules to maintain integrity in the eyes of the workforce and ensure that safety as "tribal knowledge" is reinforced starting on the first day of work. All levels, especially facility management, must talk "safety" to be sure that core value is continuously communicated. Managers should be trained in people skills to ensure they can appropriately support and respect their employees.
USBR 21 Team Reports (n=4) *(#4, 6, 8, 18)*	Reinforces and Enhances	Supervisors and managers need to visit employees at their worksites, listen to them, show support and a sense of cooperation, and consistently act with integrity in order to earn workers' trust and commitment to safety.
USBR Team 14 Survey *(PNR compared to USBR, n=10 questions)*	Reinforces and Enhances	Management might over-estimate their rapport with workers. Workers might have more trustful rapport with (and experience more respectful support from) immediate supervisors, and that dynamic progressively weakens up the management hierarchy. This might be linked to workers' sense that higher management show less integrity by not following the rules and by not equitably enforcing safety. Managers also focus on priorities that conflict with employee safety.

Data Source	Alignment w/UNC Findings	Relevant Findings
USBR Team 14 Survey *(PNR narrative responses, n=17 of 201 comments)*	Reinforces	Workers observe that managements' priorities do not always align with the agency's core value of safety, and this is reflected in a lack of responsiveness toward workers' safety concerns.
Relevant PNR initiatives	Could help to address	• Updating the core professional competencies • PNR 360 evaluation • Annual USBR FEVP survey • Leadership training • MESH or other supervisor training(s) • PNR mentoring program

Theme Data

A) UNC Interviews

During the interviews, participants shared opinions about the relationships that management should be building with workers by visiting their worksites, striving to build relationships with workers, expressing support and caring for them as people (not just employees), and demonstrating integrity through their actions (Table 17).

Table 17. Management Relationship with Workers (UNC Interviews, n=96)

	PNR Percent	Important Differences across PNR[a]	
		Area[b]	Position[c]
1. Management understanding and knowledge			
a. Negative comments	73%		
b. Positive comments	41%	GC (19%), RO (77%)	CT (19%), M (83%)
2. Management visit workers at their worksites			
a. Negative experiences and opinions	39%	SR (20%)	F (55%)
b. Positive experiences and opinions	31%	GC (13%)	CT (6%), M (74%), X (50%)
c. Should happen more	38%	CC (50%)	M (65%), X (50%)
3. Building relationships is a key aspect of rapport	31%	RO (54%)	M (70%), X (60%)
4. Management needs to do more to support workers	29%	GC (48%), SR (10%)	F (55%)
a. Employee knows mgmt respects/cares/supports	27%	CC (59%)	M (65%)
5. Management needs to demonstrate integrity	22%		M (43%)

[a] Blank cell means no important differences to report

[b] CC = Columbia-Cascades area, GC = Grand Coulee, SR = Snake River area, RO = PN regional office

[c] CT = craft/trade, F = foremen, M = managers, SS = safety staff, X = supervisors

Management's Level of Understanding and Knowledge. PNR's workforce shared comments that reflect their opinion about management's level of understanding and knowledge to fulfill a managerial function. Most often the comments were negative (73%) rather than positive (41%). Negative perceptions included the awareness that managers did not have technical knowledge, yet were making technical decisions which seemed either unsafe or unsustainable. Employees perceived this as representative that managers were focusing more on aspects related to their own priorities and not related to the work production and reality of safety considerations faced by workers in the facilities and field settings.

Negative perceptions of interpersonal skills included managers who routinely failed to demonstrate respectful, accepting/open, and interactive behaviors with employees. Workers' positive perceptions were based on

experiences with specific managers who demonstrated both technical and interpersonal knowledge, skill, and a more comprehensive understanding for their decision and judgements. Workers expressed trust in these managers. Managers' positive perceptions of their understanding and knowledge were usually expressed as a grasp of the system complexities relative to a worker's more limited vision of the work needed for the entire operation. Managers also perceived their interpersonal skills to be stronger than experienced by workers.

Management Visiting the Worksite. Management's relationship to workers begins when managers and supervisors make a committed effort to visit workers at their worksites and engage with them to learn more about their job and how they perform their work. Among the interviews discussing visits, worker and manager perceptions seemed out of alignment in terms of frequency and effectiveness of management visits. Some of the Craft/Trade workers had never personally interacted with high-level managers, and many reported never having seen upper management "on the floor" outside an agenda-driven visit such as an investigation, facility inspection, or formal tour. In contrast, most managers reported visiting worksites, although many admitted they should visit more frequently than they do. Most of the foremen, supervisors, and safety staff discussed the importance of management visiting the worksites, and expressed that it does not happen often enough.

Craft/Trade interviews shared both positive and negative perceptions of managerial visits. Positive aspects included the chance to interact and build relationships and for workers to observe the behavior of managers. Negative aspects of management visits included interacting during times when hazard conditions are higher and workers might be distracted by the visitors or need to ensure their safety. Some interviews mentioned past visits where managers seemed to have a hidden "agenda" that upset workers and eroded their trust in management. Many workers expressed a desire for management to visit without hidden motives, so management can observe them at work, inquire about their jobs and the environment, and learn about their work life and working conditions.

Efforts to Build Relationships. Some managers and supervisors commented on the value of making it a priority to build relationships with workers. Interviewees linked the sense of "connection" from these relationships directly to the sense of "culture" in the workplace, with negative consequences described as arising from poor or weak management relationships with the workforce. Employees expressed a desire for their managers to be "people persons" who would get to know workers in a more personal and human way, not just as their job title. The quality of relationship was also expressed through a desire for managers to listen and seek to understand the worker perspective. Some concern was described about the hiring of introverts as managers, indicating that these managers allow their natural preference for introverted activities to dominate their management style. The managers who spoke about relationship building efforts frequently reflected on current negative experiences in their Areas, and contrasted them with excellent managerial skills they've observed in other organizations where the managers emphasized relationship-building. The bottom-line from the worker perspective was that when managers and supervisors build genuine relationships with workers, it inspires commitment and a dedication to the job and the agency.

Showing Respect, Support, and Caring. Workers, and especially foremen, described the need for management to respect their knowledge and experience, to demonstrate support for their contributions, and to treat workers first as human beings. These observations were most frequent in Grand Coulee (where much of the workforce reported little positive interaction with managers) and least frequent in Snake River (where the workforce spoke with pride about their family/team style of working that closely involves supervisors and some managers). In contrast, two thirds of managers expressed their belief that employees already know that managers "care about their safety." This suggests a limited perception about what workers hope to receive from management in terms of respect, support, and caring. Workers who shared stories about respectful and supportive managers described their management style as: seen frequently on the floor, interested/curious, constructive in their feedback, and always approachable with open-door policies.

Demonstrating Integrity. Almost one quarter of interviews discussed a range of managerial behaviors which can be characterized as "demonstrating integrity." Workers spoke positively about managers who align their actions and words, are transparent about their reasoning and decisions, admit mistakes, and speak with sincerity. Workers spoke negatively about managers who they consider to be secretive, duplicitous, unfair, and sometimes even arrogant and bullying. Workers linked the negative managerial behaviors to a loss of credibility. Some interviews differentiated middle from upper managers in terms of their behaviors that do or do not demonstrate integrity. They held upper management (Regional/Area/Power Office/Field Office leadership) to rigorous standards, but suggested that middle management (O&M/Facility managers and supervisors) might be compromised by their attempt to align employee needs with leadership directives.

From the stories and descriptions, it was clear that when individual managers or supervisors do not act with integrity, the effect is corrosive on the credibility of that manager (i.e., workers downgrade their trust for that manager or supervisor). Also, negative observations about one manager can erode trust in management more generally.

On the flip side, workers' comments and stories about positive relationships with select managers across the region suggested that such work relationships are cultivated and nurtured, and they begin with the supervisor or manager's visibility and interaction with workers in the setting where the workers spend most of their time. Some managers described their priority for visiting worksites to mingle with employees and "be seen" no matter how busy or overwhelming their workload. Their dedicated approach, and its obvious benefits to the work culture, suggests that there are no short-cuts to building and maintaining work relationships. Rather, supervisors and managers should think of it as an investment, with the dividends being employees' commitment to management, the agency, and the value of safety.

B) Benchmark Interviews (n=7 of 8)

Seven of the benchmark interviews conveyed the importance of management demonstrating that they value the workforce as people rather than merely employees. If management genuinely holds that value, then they would find a way to secure and allocate the necessary resources and support for workplace safety.

Visiting workers and building relationships

1. High-level managers pursue interactions with workers and get to know them personally, especially the Union members.
2. A safety culture demonstrates that the organization values the people - that we care about each other - and this gives each employee a sense of worth beyond just their job title.
3. The soft-side of management is neglected. Personality has a huge impact on safety culture. High-level managers cannot manage safety the way they manage a budget. Need a good management leader to role model excellent management style.

Demonstrating integrity

4. Mgmt has to follow their own directives.
5. Mgmt has to discuss their own safety behaviors and risks, so that their process and dedication filter down throughout the organization.
6. Safety culture grows long-term from tribal knowledge (the same way that many workers learn – prior generation teaches the next). So, early indoctrination is needed right from the top (i.e., what won't be tolerated in terms of behavior). Then it becomes a way of life.
7. If the facility Superintendent is not talking "safety," then no one is.

Showing respect, support and caring

8. Introverted managers need training on people skills to manage employees.
9. Military emphasizes training managers in skills for interacting with people.

10. Supervisors and other managers always try to respect the knowledge of the workers (they know much more than we do about their jobs).
11. Supervisors are taught to listen and show respect.
12. When leadership "gets it" (i.e., safety) they provide the necessary resources and support for workers to do their jobs safely.
13. Employees and union began to take safety seriously when the organizational leadership got serious about calling Stop Work, getting adequate resources for jobs, bringing in the right equipment, weeding out the bad supervisors, and holding meetings to update workers.
14. Safety culture is demonstrated from the top through dedication of resources to support the workers as valuable and important. The foundation of the culture is the valuing of people.

C) Findings from the USBR 21 Teams (n=4 of 21)

Four of the 21 Teams (#4, 6, 8, 18) reported findings and recommendations about management relationship to workers, and the information aligns closely with the UNC interview findings. The teams' recommendations focus on managers' worksite visits, and the way management interacts with employees to listen to their needs, act with integrity, and earn the trust of employees. Such management behavior will inspire employees' commitment to the agency and its value of safety.

Team 4 –Communication Plan

1. Create alignment between what we say and do regarding safety and health (pp 4-7).

Team 6 – Strengthen SOH Commitment

1. Management should listen to and validate employee concerns (pp 29-31, Appendix D has a Supervisor Toolbox).
2. Management demonstrate personal commitment by discussing some aspect of safety every day with employees (pp 29-31, Appendix D has a Supervisor Toolbox).
3. Management determine what motivates individuals or workgroups (pp 29-31, Appendix D has a Supervisor Toolbox).
4. Supervisors should strive to develop a work environment that motivates employees to be involved in SOH practices (pg 12).

Team 8 – Trust and Cooperation

1. Four objectives are to build trust and cooperation/support for: i) themselves, ii) each other, iii) Reclamation, and iv) USBR's safety culture (pg 1).
2. Management should visit field locations (pg 18).
3. Managers can inspire trust by applying the following trust-building behaviors: i) show care for others: ii) act with honesty, integrity and in best interest of others; iii) demonstrate respect; iv) right wrongs; v) show loyalty; vi) extend trust to others; vii) take action and walk the talk; viii) demonstrate ethical conduct; ix) keep commitments; x) deliver results; xi) practice accountability; xii) keep improving; vii) be flexible; xiii) communicate by listening first and straight talk; xiv) confront reality; xv) clarify expectations; and xvi) create transparency (pg 6).
4. Supervisors (and other managers) should express honestly a sense of caring about the employees (pg 8).

Team 18 – Supervisor Safety Training

1. MESH Training is anticipated to address motivating practices of supervisors (as noted by Team 6 on page 12).

D) How compare to Team 14 survey opinions?

Team 14 Survey – Quantitative and Likert-Scale Questions

The survey questions that pertain to management rapport with workers suggest that managers perceive their rapport with workers as more positive than the Craft/Trade workers perceive it (Table 18). The sense of caring for the safety of workers is fairly high, but could use improvement among higher management. Workers' trust is higher for direct supervisors than for management above the supervisor. Both supervisors and management could improve their demonstration of integrity as observed in their consistency for addressing safety issues, and managers obeying the agency's safety procedures and rules. Workers also report that more than 1/3 of managers do not apply safety rules similarly to all employees.

Table 18. Management Relationship with Workers (Team 14 survey)

USBR Team 14 Survey Question		**Responses Included**	**PNR** (n = 721)	**USBR** (n = 3083)	**Employee Type**[a]
MANAGEMENT					
Q5.3_1	Managers in my Region care about my safety.	Agree	80%	83%	SE (100%) GS (87%) FW (61%)
Q5.3_4	Managers are consistent in addressing safety issues.	Agree	61%	65%	SE (100%) GS (67%) FW (45%)
Q5.3_5	Managers apply the same safety rules to everyone.	Agree	63%	69%	SE (100%) GS (67%) FW (50%)
Q5.3_7	Managers follow safety processes and rules.	Agree	62%	68%	SE (100%) GS (67%) FW (47%)
Q8.1_1	How much do you trust management with respect to safety?	High Trust	74%	82%	SE (100%) GS (83%) FW (48%)
SUPERVISOR					
Q6.3_1	My supervisor cares about my safety.	Agree	87%	88%	SE (100%) GS (89%) FW (81%)
Q6.3_3	My supervisor encourages me to work safely.	Agree	88%	87%	SE (100%) GS (88%) FW (85%)
Q6.3_9	My supervisor is consistent in addressing safety issues.	Agree	73%	74%	SE (100%) GS (74%) FW (65%)
Q6.3_10	My supervisor follows safety processes and rules.	Agree	77%	80%	SE (100%) GS (80%) FW (70%)
Q8.1_2	How much do you trust your supervisor with respect to safety?	High Trust	87%	91%	SE (100%) GS (90%) FW (78%)

[a] SE = Senior Executive; GS = General Schedule; FW = Federal Wage

Team 14 Survey - Question 10.4: *"How would you improve your workplace's safety program?" (UNC analysis, n=17 of 201 comments, from 161 PNR respondents)*

The survey's narrative comments further articulate the workers' perceptions about management priorities that do not align with the agency's core value of safety, and a lack of responsiveness toward worker safety concerns.

1. **Management not showing support and caring/concern for employees (n=7).** Instead, management is demonstrating concern for agency liability when injury incidents occur. PNR managers fail to show concern for workers when they:
    a. Request and review the JHA prior to inquiring about the injured employee's wellbeing
    b. Downgrade an employee's performance review if they are injured at work
    c. Urge injured workers to "return to work" prematurely in order to avoid recorded lost time with the agency
    d. Fail to keep injuries confidential to help decrease negative coworker reactions
    e. Seem more concerned with their own reputation than with helping the agency admit systemic safety problems and working to address them
2. **Management priorities are cost, work deadlines, and injury statistics . . . not safety (n=5).** This perception arises when employees are pressured to "work long hours, donate time, and work weekends, holidays, and other periods when leave is charged" in order to ensure that work accomplishment satisfies upper management. Management also deprioritize safety when faced with competing priorities, and this results in annual or monthly PMs being skipped by management's request, while they encourage workers to "be careful." When employees experience their safety concerns being ignored due to cost, they believe management is revealing its actual values, which are not consistent with the agency's proclaimed top value of safety.
3. **Leadership is not perceived to be actively promoting safety (n=5).** This negative perception arises when upper management overrides workers' safety concerns and fails to implement safety protocols that are needed. Safety accountability starts at the top. USBR is perceived as not genuinely promoting safety if it has safety staff reporting to Area/Facility managers (who necessarily have competing priorities to safety).

E) Relevant PNR initiatives

1. PNR's EEO staff are identifying whether and how to enhance the core/professional competencies for select positions (and these will then link to training opportunities)
2. PNR's EEO staff are conducting 360-evaluations to identify staff who could benefit from mentoring program
3. USBR Annual FEVP Survey to assess employee satisfaction (to provide managers and leadership with feedback)
4. Leadership training is in development
5. MESH or other supervisor training(s) are in development
6. PNR mentoring program

THEME #4: Management's Communication with Workers

Evidence across Data Sources (Triangulation)

UNC Summary Findings:	*Management's Communication with Workers*	
Many interviewed employees disclosed low satisfaction with (and negative perceptions of) management's current communications, and identified perceived communication gaps and barriers within the management hierarchy. Employees also identified ways that management could improve their communication by including the "big picture," by inquiring into and honoring employees' safety concerns, and ensuring follow-through of safety requests (which includes keeping workers updated on progress). Among the supervisors who purposefully share PNR communications with workers, most admitted the need to translate or tailor the message to improve its relevance to workers' real-life duties. Interviewees identified a few specific skills to help improve PNR managements' communications with workers.		
Other Data Related to Theme		
Data Source	**Alignment w/UNC Findings**	**Relevant Findings**
UNC Benchmark Interviews (n=2 of 8)	Reinforces and enhances	Culture surveys can be used to identify communication gaps. High-level mandates might seemingly backfire at first, but can be ultimately useful for helping shift safety culture. Pathways of communication can be fostered when high-level managers actively participate in safety meetings (while being careful to not dominate the meeting discussions).
USBR 21 Team Reports (n=6) *(#2, 4, 6, 8, 11, 17)*	Reinforces and enhances	PNR needs to improve managements' communication style, their ability to foster trustful relationships for effective communication, and the materials and context for management-worker communications. Supervisors need training and materials to guide focused safety inquiries and discussions. Management needs to improve communication about policies and procedures to ensure employees are well-informed. Internal communication systems need updating to improve relevance and employee access.
USBR Team 14 Survey *(PNR compared to USBR, n=4 questions)*	Reinforces and enhances	Communication patterns suggest that some supervisors and managers prioritize gaining information for their own safety planning needs more than communicating employee safety concerns into the organization. This is reflected in the relative lack of follow-through to effectively communicate upstream the employees' safety concerns or to share safety practices and lessons across the region.
USBR Team 14 Survey *(PNR narrative responses, n=29 of 201 comments)*	Reinforces and enhances	Employees want PNR to improve communication styles, use active listening, explain the safety program, share incidents and near misses, and improve communication methods for workers in the field.
Relevant PNR initiatives	Could help to address	• Updating the core professional competencies • PNR 360 evaluation • Annual USBR FEVP survey • Leadership training • MESH or other supervisor training(s) • PNR mentoring program

Theme Data

A) UNC Interviews

PNR employees discussed many aspects of communication and how it influences relationships between management and workers. Many interviewed employees disclosed low satisfaction with (and negative perceptions of) management's current communications, and identified perceived communication gaps and barriers within the management hierarchy. Employees also identified ways that management could improve their communication by including the "big picture," by inquiring into and honoring employees' safety concerns, and by ensuring follow-through to the origin of any inquiries or concerns. Among the supervisors who endeavor to share organizational communications with workers, most admitted the need to frequently translate or tailor the message to improve its relevance to workers' real-life duties. Interviewees identified specific skills to help improve management-worker communications in PNR.

Satisfaction with management-worker communication. When discussing their level of satisfaction with communication between management and workers, interviewees were almost three times more likely to report dissatisfaction (44%) than satisfaction (16%) with management communication (Table 19).

Table 19. Satisfaction with Management's Communication with Workers (UNC Interviews, n=96)

	PNR Percent	Important Differences across PNR[a]	
		Area[b]	Position[c]
Not satisfied	44%	CC (59%)	
Satisfied	16%	CC (32%)	X (40%)

[a] Blank cell means no important differences to report
[b] CC = Columbia-Cascades area, GC = Grand Coulee, SR = Snake River area, RO = PN regional office
[c] CT = craft/trade, F = foremen, M = managers, SS = safety staff, X = supervisors

Only Columbia-Cascades interviews surpassed the regional average for both negative and positive satisfaction with communication. Craft/Trade, foremen, managers, and safety staff described more negative than positive communication satisfaction. Supervisors were more likely (40%) than all employees (16%) to be satisfied with management's communication to workers.

Perceptions of management communication. Employees expressed both positive and negative perceptions of management's communication with workers, with more negative than positive perceptions discussed (Table 20).

Table 20. Perception of Management's Communication with Workers (UNC Interviews, n=96)

	PNR Percent	Different from Region %	
		Area	Position
Negative perceptions	35%	GC (58%), SR (13%)	CT (52%), F (55%), XE (60%)
Positive perceptions	7%	--	--

Positive Perceptions. Only a few interviews expressed a positive impression of management communication. These comments focused on the sense of "out in the open" dialogue from some managers who strive to explore problems and solicit creative ideas from the workforce. Those managers were remembered as intentionally thanking employees for their input and participation in the dialogue. These communication

actions were linked to the sense that management was showing respect for workers and an appreciative understanding of their jobs.

Negative Perceptions. Employees described how their impression of management communications is influenced by the integrity of the manager. If a manager demonstrates (or has a reputation for) a lack of integrity, that manager's communication is not as quickly assimilated, especially by Craft/Trade workers and supervisors. Some workers described specific communication behaviors that further diminish management's integrity, such as "double-speak" by not walking the talk, and invitations for "open communication" that actually have hidden disciplinary motives. About one third of Grand Coulee interviews raised these integrity dilemmas regarding managerial communication.

Foremen and supervisors disclosed that management communication is also weakened when the manager (or the authoring office) is perceived as "disconnected from workers' reality." Examples include when the directives don't accurately correspond to the work process, or when management conveys "false urgency" to the workers over an issue that is later proven to be a premature reaction.

Gaps and Barriers to Communication. More than one quarter of interviews discussed the gaps and barriers in communication, and employees identified gap/barrier locations within the management hierarchy (Table 21).

Table 21. Communication Gaps and Barriers (UNC Interviews, n=96)

	PNR Percent	Different from Region %	
		Area	Position
Communication gaps and barriers	26%	GC (45%), SR (3%), RO (46%)	F (45%), XE (40%)

In general, managers identified supervisors as the main problem. Foremen and supervisors identified the primary problem in the level just above them. Craft/Trade workers identified the highest levels of the organization as the source of communication gaps. With the exception of a few high-level managers, almost no interviewees identified themselves as the source of communication gaps or barriers.

Employee Type	Believes the communication gap/barrier is located at:
Managers	Supervisors
Supervisors	Mgmt: Facility, Area
Foremen	Supervisors
Craft/Trade	Mgmt: Area, Region

A major gap/barrier that was explicitly discussed by interviewees was their access to information to do their job. Some of the foremen and supervisors at Grand Coulee were concerned that they did not have access to information they needed to do their jobs effectively and safely. Sometimes the concern focused on the lack of relevant and up-to-date technical specifications (engineering or "as-built") and standard operating procedures (SOPs), or the challenges when forced to use paper copies of technical information while in the field. Some people described the condition of some of the technical and equipment specifications, with hand-written edits and commentary written on the sheets that were several years old.

Some of the supervisors and workers discussed a related concern that PNR is not preserving its institutional memory about its facilities. For example, many workers appreciate PNR dams and power facilities for their historical significance and uniqueness of construction. But deep knowledge of each facility's idiosyncrasies

resides within the minds of a relatively small number of older workers (many approaching retirement). They requested that PNR consider this unique knowledge as an important asset, and preserve and communicate it accordingly.

Some Craft/Trade workers continued exploring the access to technical information, and discussed the need for smart-phone or tablet applications (apps) to review or update the specifications when in the field.

Additionally, some Grand Coulee workers described their lack of access to PNR emails and updates for two reasons: i) Supervisors limiting workers' access to computers in order to keep them "on the floor," and ii) too few computers for the number of employees needing access.

Improve communications. Many interviews discussed how management communicates with workers and identified concerns and some adaptive methods used to facilitate communication down the management hierarchy (Table 22).

Table 22. Improve Communications (UNC Interviews, n=96)

	PNR Percent	Different from Region %	
		Area	Position
Improve the message content	28%	GC (45%), SR (10%)	XE (60%)
Convey the "big picture" to workers	21%		M 35%)
Identify and address workers' concerns	18%		F (36%), XE (40%)
Need to translate, tailor, or reinforce for workers	17%		XE (60%)

More than a quarter of all interviews discussed the need for management to improve the content of their communications for relevance and clarity. One aspect to improving content was the need for management to convey the "big picture" during communications with the workforce, and this was discussed uniformly across all Areas and employee types. About 35% of managers suggested that employees could work more safely if they had a broader sense of what they are trying to achieve given any temporary or permanent system constraints. Implicit in these remarks is that too often management conveys to workers a task order without the broader context. A few interviews suggested that workers can apply critical thinking skills to safety problems when they understand the broader context. This includes explaining "Why" when changing a routine process or making an exception to a typical activity/task.

Workers also discussed the need for management to better identify and address workers' concerns through direct communication (i.e., by actively eliciting and documenting the concerns, then subsequently conveying those concerns up the management hierarchy, and finally by following-through to update workers on management action or pending action). Some facility and Area managers were described as focusing primarily on satisfying upper management, and not on relating to and guiding the workforce.

Some Supervisors disclosed their need to translate or tailor some communications to improve comprehension and acceptance by workers. This translation was discussed more frequently in Columbia-Cascades and Grand Coulee than in other Areas.

Skills to improve communication. Interviewees reflected on both positive and negative experiences with management communication, and identified some key skill areas for supervisors and managers to improve their communication (Table 23). Supervisors who described their own emphasis on high-quality communication were concerned about the need for all supervisors and managers to more effectively match their communication style to the recipient. Regional management echoed this observation by suggesting that

all managers need to learn and apply active listening skills, and that supervisors need formal training in communication skills.

Table 23. Skills to Improve Communications (UNC Interviews, n=96)

	PNR Percent	Different from Region %	
		Area	Position
Skills to improve communication	28%		XE (50%)

Some supervisors emphasized a need for skillful communication by managers during disciplinary or corrective discussions. For example, they want management to use more restraint when disciplining workers during a job activity. They suggested also that managers learn to admit mistakes and invite feedback and dialogue about their own errors. They believe that such transparency could enhance workers' perception of management's integrity, and establish further commonality between employees as humans who make mistakes and learn from them. Follow-through was mentioned frequently because the lack of it causes delays, missed opportunities, and a sense of diminished support from management. Two forms of follow-through were considered important: a) informational follow-through for Craft/Trade questions that required additional approvals or information; and b) task follow-through in terms of acquiring needed materials/parts, scheduling meetings or trainings, or facilitating the input needed to identify mitigations for hazardous conditions at the worksite. In essence, workers requested that foremen, supervisors, and managers conscientiously "close the loop" by reporting back to the workforce when job aspects are pending, delayed, etc. (and to provide brief explanations that help workers understand the system aspects that might be part of any delay). These workers stated their desire to contribute to solutions (rather than be left in the dark), but that they need better informational follow-through from management.

B) Benchmark Interviews (n=2 of 8)

Two of the benchmark interviews specifically discussed management communication with workers. Culture surveys can be useful to identify communication gaps, with a goal being to tighten any communication "disconnects" in the management system. One potential disconnect can happen in organizations when a high-level communication seemingly reprimands the workforce, and might be negatively received by workers. But such top-down mandates can be helpful "like good medicine that is not wanted at the moment, and causes grumbling, but can be ultimately helpful."

Communication pathways in an organization can be improved when high-level managers attend safety meetings, but actively participate without dominating. When managers make this effort, the dialogue at those meetings can set a precedent which can foster and promote communication across the organization.

C) Findings from the USBR 21 Teams (n=6 of 21)

Six of the teams (#2, 4, 6, 8, 11, 17) reported findings and recommendations about management's communication to workers. Three teams (#4, 6, 8) focused on communication style, the trustful relationships needed for effective communication, and ensuring that managerial staff have the appropriate materials. Two teams (#11, 17) identified a need for supervisors to receive training and materials to guide focused safety inquiries and discussions. Team 2 focused on improving communication about policies and procedures to ensure employees are well-informed. Team 11 recommended that internal communication systems be updated to improve relevance and employee access.

Team 2 – Implement Safety Policy (ANSI Z10)

1. Improve communication of USBR directives and goals to workforce, which might necessitate periodic site visits to discuss/reiterate goals (pg A7).
2. Implementation Perception Survey (2014) found a general lack of knowledge about SAF P01 (pg 5). The policy might not have been communicated adequately to all levels of USBR (pg 13).
3. Assign rotational "safety lead" for first-line supervisors or workers to help ensure team safety considerations are addressed including discussions with workers or supervisors observed unsafe behaviors, unaddressed hazards, procedural discrepancies, and/or close calls. Have the safety leads meet with SOH representatives to discuss and resolve issues (pg A7).
4. Team 2 recommendations are designed to improve communication and resolve gaps listed in the Federal Employee Viewpoint Survey (FEVS) - Appendix A (pg 1, #5).

Team 4 – Communications Plan

1. Create alignment between what we say and do regarding safety and health (pp 4-7).
2. Safety talking points are drafted for 5 topic (pp 4-7).
3. Use Partnership Council quarterly meetings for Union reps to provide feedback/suggestions to USBR leadership (pg 7).

Team 6 – Strengthen SOH Commitment

1. Management should listen to and validate employee concerns (pp 29-31, Appendix D has a Supervisor Toolbox)
2. Management demonstrate personal commitment by discussing some aspect of safety every day with employees (pp 29-31, Appendix D has a Supervisor Toolbox).
3. Set a good example; do not allow short-cuts; and redirect behaviors in a positive manner. Ask questions that can be more mindful of hazards or personal practices (pp 29-31, Appendix D has a Supervisor Toolbox).
4. Communicate expectations of leadership engagement in safety (pg 16).

Team 8 – Trust and Cooperation

1. Supervisors (and other managers) should express honestly a sense of caring about the employees (pg 8).
2. Trust building behaviors include: i) communicate by listening first and straight talk; ii) confront reality; iii) clarify expectations; and iv) create transparency (pg 6).
3. Mgmt should communicate resolution of identified safety issues to staff (pg 18).
4. Incident investigation teams should discuss and acknowledge that humans cannot always be error-free, and that employees should be reinforced for reporting the incident (pg 23).

Team 11 – Information Sharing Plan

1. Improve employee access to internal communications because traditional internal communication tools are ineffective (pg 2).
2. Supervisors need training to solicit employee input on safety such as "real life" stories. Training should include active listening skills and inquiry methods (pg 2).

Team 17 – Employee Safety Training

1. Team 17 developed a checklist for supervisors to help them facilitate one-on-one safety discussions. Can also be used with new employees (pg 4).

D) How compare to Team 14 survey opinions?

Team 14 Survey – Quantitative and Likert-Scale Questions

The Team 14 survey identified that 75% of employees believe their managers communicate with workers about safety issues (Table 24). The survey also identified that although a majority of PNR employees think their supervisor solicits input to inform decisions about safety issues, only about half of PNR employees believe their supervisor communicates their concerns upstream. Both issues are important to consider in terms of employee type, because only about half of FW employees agree with either statement, while 100% of higher management agree with both. In addition, less than half of all PNR employees think management effectively shares safety practices and lessons learned across the region. Comparing these responses by employee type suggests that some supervisors and managers serve their own safety planning needs more than they help to steward employee safety concerns toward upper management.

Table 24. Management's Communication with Workers (Team 14 survey)

USBR Team 14 Survey Question		**Responses Included**	**PNR** (n = 721)	**USBR** (n = 3083)	**Employee Type**[a,b]
Q5.3_2	Managers communicate with workers on safety issues.	Agree	75%	76%	SE (100%) GS (80%) FW (57%)
Q6.3_4	My supervisor consistently explains my safety concerns to management.	Agree	55%	58%	SE (100%) GS (57%) FW (50%)
Q6.3_5	My supervisor seeks my input on safety topics.	Agree	73%	71%	SE (100%) GS (73%) FW (69%)
Q10.1_3	Best practices and lessons learned are shared across offices in my Region.	Agree	48%	52%	SE (60%) GS (55%) FW (26%)

[a] UNC analyzed the survey raw data to produce PNR-specific proportions for employee types.
[b] SE = Senior Executive; GS = General Schedule; FW = Federal Wage.

Team 14 Survey - Question 10.4: *"How would you improve your workplace's safety program?" (UNC analysis, n=29 of 201 comments, from 161 PNR respondents)*

In the narrative responses, employees want PNR to improve communication with employees, and suggest focusing on the timeliness/speed for sharing incidents and near misses, using active listening skills, more effectively explaining the safety program to employees, and improving communication connections for workers who are in the field.

1. Need to improve communication about the safety program (purpose, policies, committees, components) and what it does to make it more visible (n=12)
2. PNR should communicate swiftly to all employees any necessary information about major injury incidents, near-misses, and major safety complaints (n=7)
3. PNR should educate employees about what safety committees do; Areas should update quarterly on committee goals and progress; and upper management should take action on committee recommendations (n=4)
4. Need to improve technology and procedures for communicating with field-going staff (n=3)
5. Provide a suggestion process (n=2)

6. Make communication a norm among employees with informal stretching sessions while making announcements and reminding everyone of the safety goal and caring for coworker safety (n=1)

E) Relevant PNR initiatives

1. PNR's EEO staff are identifying whether and how to enhance the core/professional competencies for select positions (and these will then link to training opportunities)
2. PNR's EEO staff are conducting 360-evaluations to identify staff who could benefit from mentoring program
3. USBR Annual FEVP Survey to assess employee satisfaction (to provide managers and leadership with feedback)
4. Leadership training is in development
5. MESH or other supervisor training(s) are in development
6. PNR mentoring pprogram

THEME #5: Management Responsiveness to Safety Concerns

Evidence across Data Sources (Triangulation)

UNC Summary Findings:	*Management Responsiveness to Safety Concerns*
Workers are willing to report safety concerns if they cannot immediately resolve them and employees commented that this is a welcome change from previous PNR conditions. An employee reports a safety concerns to a supervisor who decides whether/how to report it upstream into management. Employees differ in their perception of the effectiveness of that upstream communication: Craft/Trade workers generally perceived it as not effective, and management and safety staff perceived the opposite. Part of the misalignment seems due to a lack of follow-up to workers from management (e.g., acknowledgement of issue, and steps/timeline/progress toward improvement). Although most employees think that PNR safety concerns are being addressed, they do not think they are addressed in a timely manner. Most workers consider engineering solutions more necessary than behavioral changes. Employees who have been working with long-standing hazards would like management to prioritize the improvement of these hazards. In addition, workers want management to conduct the necessary long-term planning for larger-scale improvements (excluding the planned modernization/upgrading to generators). A formal timeline of planned improvements could be shared with employees. In general, workers want managers to consult them more often about safety concerns, as managers can otherwise underestimate the urgency or choose solutions that workers deem inappropriate. Managers, in turn, would like workers to better understand the organizational barriers that restrict or delay solutions. Safety staff might be helpful in bridging these two perspectives.	

Other Data Related to Theme

Data Source	**Alignment w/UNC Findings**	**Relevant Findings**
UNC Benchmark Interviews (n=4 of 8)	Reinforces and enhances	Communication of safety concerns begins at both tailgate safety meetings and larger formal safety meetings. Supervisors need to invite employee concerns before work begins, resolve what they can, communicate upstream what needs management attention, and provide workers with progress updates. Management needs to respect workers' safety concerns, allocate resources to address them, and communicate progress back to supervisors.
USBR 21 Team Reports (n=12) (#2, 4, 6, 8, 9, 11, 12, 13, 15, 16, 20, 21)	Reinforces and enhances	Supervisors should constructively discuss employee safety concerns and behaviors. Managers should be responsive to concerns, assure employees of no reprisal for reporting, and work with safety committees to find solutions. Safety staff should be more present at facilities to help address safety concerns during planning, construction, and daily work. The hazard reporting process should be easy and anonymous. Follow-up communications about safety issue resolution needs to be more detailed and consistent. Safety should be promoted by allocating necessary resources, providing training, holding employees accountable for safe workplaces, and using Prevention Through Design (PtD) for new facilities/equipment.

Data Source	**Alignment w/UNC Findings**	**Relevant Findings**
USBR Team 14 Survey *(PNR compared to USBR, n=21 questions)*	Reinforces and enhances	Approximately two thirds of employees reported that their workplace safety program is responsive and addresses safety concerns. FW workers perceived their supervisors as responsive to safety concerns, but inconsistent in communicating those concerns upstream into management. Managers were perceived as less responsive or communicative about safety issues. Only about one third of FM workers believe safety decisions are made by qualified people, or that managers are held accountable for unsafe workplaces. Two thirds of FW employees know of unresolved safety issues in the workplace (compared to only a quarter of other employees). 70% of FW and GS employees believe budgets for safety equipment are adequate.
USBR Team 14 Survey *(PNR narrative responses, n=38 of 201 comments)*	Reinforces and enhances	Safety solutions get deprioritized due to budget and production pressures. The effectiveness of safety staff and committees is also a concern. Safety staff lack the authority to implement safety solutions, and need to spend more time at worksites in order to help with safety and better understand workers' jobs. Employees need better safety communication and an easier process to submit safety suggestions.
Relevant PNR initiatives	Could help to address	• Updating the core professional competencies • PNR 360 evaluation • Annual USBR FEVP survey • Leadership training • MESH or other supervisor training(s) • PNR mentoring program

Theme Data

A) UNC Interviews

Many interviews discussed the ability of management to understand and address the safety concerns of workers (Table 25).

Table 25. Understanding and Addressing Safety Concerns (UNC Interviews, n=96)

	PNR Percent	Important Differences across PNR[a]	
		Area[b]	Position[c]
1. Reporting safety concerns	39%	GC (55%), SR (20%)	SS (58%)
2. Communicating safety concerns to mgmt	34%		
3. Addressing safety issues			
a. Safety issues are fixed	41%		F (64%), SS (25%)
b. Safety issues are not fixed soon enough	40%	GC (61%), SR (23%)	
a. Disagreement about appropriate solutions	39%	GC (58%)	F (55%)
c. Authority for addressing safety issues	28%	GC (42%)	F (64%)
d. Safety issues are discussed, attempted to fix	25%	CC (41%)	

[a] Blank cell means no important differences to report

[b] CC = Columbia-Cascades area, GC = Grand Coulee, SR = Snake River area, RO = PN regional office

[c] CT = craft/trade, F = foremen, M = managers, SS = safety staff, X = supervisors

Reporting safety concerns. Many employees stated that employees seem willing to report unsafe working conditions, and contrasted this with previous conditions that discouraged the reporting of safety concerns. Many also spoke of the importance of routine and consistent facility inspections to help detect safety concerns. Regional safety staff spoke of the need for safety staff in all Areas to take a positive, customer service approach with employees when identifying unsafe behaviors or work environment and housekeeping practices.

Communicating safety concerns to management. Management and Craft/Trade workers are not aligned in their perception of how effectively safety concerns are communicated upstream into the organization. Managers, supervisors, and safety staff generally reported successful communication of concerns. Craft/Trade workers generally reported unsuccessful communication. Many interviews (and most frequently at Grand Coulee) were dissatisfied with managers' attempts to keep them informed of progress in addressing their safety concerns.

Addressing safety concerns. About 40% of interviews commented that safety concerns are fixed, but not soon enough. Especially in Grand Coulee, employees reported working with long-standing safety concerns, delays in solutions that require purchasing of material or equipment, and the perceived continual decision by management to "run to failure" rather than perform required maintenance on aging equipment (even though, as one employee observed, Grand Coulee takes pride in turning a profit). Employees in Grand Coulee also reported that hazardous conditions are not always effectively communicated to employees, or might be marked with warning signs but then not fixed or physically corrected. Many employees believe that safety concerns would be best improved through engineering or environmental change. Employees from Grand Coulee also described significant challenges when updating historic facilities to modern safety standards. Managers' failing to prioritize safety concerns, especially when the solution requires funding, was perceived negatively by workers and foremen, but less uniformly negatively by management and safety staff. Many workers and foremen, especially in Grand Coulee, perceived a lack of long-term planning and consistent focus from management to address safety concerns. Several safety staff recommended introducing a formal process to track the implementation of adopted safety solutions, which would include both a timeline and follow-up requirements.

Authority for correcting safety concerns. Several employees, mostly foremen, stated that safety concerns are best addressed locally, rather than by upper management. However, they believe that solutions requiring funds or large purchases often need authorization by upper management. Sometimes regional decisions preempt their local solutions to safety problems.

Disagreement about solutions for safety concerns. Over a third of all interviews reported disagreement about appropriate solutions to safety concerns. Most comments about disagreement were from workers, foremen, and supervisors. These employees stated that managers should consult them when determining solutions to the safety concerns they raise, as managers do not understand the seriousness of many safety concerns and choose solutions that workers consider insufficient or inappropriate. This view was especially prevalent in Grand Coulee and among foremen. From managers, the most common statement was that workers do not understand the organizational-level barriers and limitations that restrict the availability of solutions to safety concerns. Safety staff agreed that managers do not always understand the seriousness of safety concerns, but that some concerns raised by workers are not actually unsafe. Safety staff reported sometimes needing to serve as mediators in disagreements between workers, or between workers and managers.

B) Benchmark Interviews (n=4 of 8)

Four benchmark interviews described how safety concerns are communicated and addressed. Communication can begin with tailgate safety meetings or pre-work discussions, where the supervisor invites workers to raise their safety concerns to ensure everyone has that opportunity. If employees have been trained on "situational awareness" of hazards, the tailgate discussion reminds workers to apply those skills throughout their day. Supervisors must communicate any unresolved safety concerns upstream to management, and provide the follow-up that will allow workers to be kept informed on the responsiveness of management to the concern and progress on improvements. Management can learn about additional safety concerns by actively participating (but not dominating) at safety meetings. Management ultimately demonstrates its commitment to safety by allocating resources toward the improvement of safety concerns in the workplace.

C) Findings from the USBR 21 Teams (n=24 items, 12 teams)

Discussing safety concerns. Supervisors should constructively discuss with workers their safety behaviors and their concerns about perceived hazards in their workplaces. Managers should be responsive by listening and validating safety concerns, assuring employees that they can identify/report safety concerns without fear of reprisal, and working with safety committees to develop solutions. Increasing the presence of safety staff at facilities could improve relationships and communication with workers, and this would allow safety issues to be better understood and addressed during work planning, construction, and daily job activities.

Tracking and follow-up. Multiple teams recommended providing employees with better follow-up communication on safety issues, including the progress and effectiveness of solutions, follow-up actions, and input from employees. One team suggested a standard electronic format to identify corrective actions for hazards. Another suggested that the Safety Factor's Dashboard feature include more leading metrics, such as the number of reported hazards addressed.

Fixing safety concerns. To address hazards and promote safety and health, recommendations included providing the necessary resources and training; holding managers, supervisors, and employees accountable for safe work environments; and using a Prevention Through Design (PtD) process when initially designing and constructing facilities and equipment.

1. **Discussing safety concerns (n=13 items, 8 teams)**
    a. **Safety staff involvement (n=6 items, 3 teams)**
        i. Team 2 – Implement Safety Policy (ANSI Z10)
            1. Assign rotational "safety lead" for first-line supervisors or workers to help ensure team safety considerations are addressed including discussions with workers or supervisors observed unsafe behaviors, unaddressed hazards, procedural discrepancies, and/or close calls. Have the safety leads meet with SOH representatives to discuss and resolve issues (pg A7).
            2. Require a minimum SOH staff presence at facilities to improve the working relationship and ensure communication, collaboration and integration into forecasted projects and to resolve issues. (pg A7)
            3. SOH staff provide assistance to identify, evaluate, and address SOH hazards (pg 10).
        ii. Team 9 – JHA Process Evaluation
            1. Review and signature of Safety Specialist when newly identified high risk hazards cannot be appropriately mitigated (pp 4-5).
            2. Review and signature of an Industrial Hygienist or SS when newly identified high risk hazards cannot be appropriately mitigated.
        iii. Team 20 – Safety Design Process
            1. SOH and O&M staff need to be included in the review of proposed facility construction designs (pg 4).
    b. **Management involvement (n=4 items, 4 teams)**
        i. Team 4 – Communications Plan
            1. Ensure employees are empowered to address safety concerns without fear of reprisal (pp 4-7).
        ii. Team 6 – Strengthen SOH Commitment
            1. Management should listen to and validate employee concerns (pp 29-31, Appendix D has a Supervisor Toolbox).
        iii. Team 8 – Trust and Cooperation
            1. Management should participate on safety committees and help develop solutions (pg 18).
        iv. Team 12 – Deficiency Tracking
            1. USBR Leadership support will be needed to ensure success of any reporting system (pg 6).
    c. **Supervisor involvement (n=3 items, 3 teams)**
        i. Team 6 – Strengthen SOH Commitment
            1. Set a good example; do not allow short-cuts; and redirect behaviors in a positive manner. Ask questions that can be more mindful of hazards or personal practices (pp 29-31, Appendix D has a Supervisor Toolbox).
        ii. Team 8 – Trust and Cooperation
            1. Dupont STOP for Supervision is a program designed to enable constructive discussions with employees about safe and unsafe work practices (pg 31).
        iii. Team 21 – Hierarchy of Controls
            1. Edit RSHS Section 4.2 (hazard assessments) to state that supervisor must include employee input when making decision about appropriate Hierarchy of Controls (pg 5).
2. **Tracking and follow-up (n=7 items, 5 teams)**
    a. Team 8 – Trust and Cooperation
        i. Management should communicate resolution of identified safety issues to staff (pg 18).
    b. Team 9 – JHA Process Evaluation
        i. Implement a standard electronic format/template for Reclamation to identify the significant steps/major activity, and the corrective actions for each identified hazard (pp 1-2).
    c. Team 13 – Leading Metrics
        i. Only 1 of 4 metrics reported in The Safety Factor is a leading metric (i.e., % of completed safety inspections) (pp 9-10).
        ii. Revise the Dashboard with: Completed safety inspections as % of anticipated inspections (pg 11).
        iii. Revise the Dashboard with: # of hazards reported and removed/mitigated (pg 11).
    d. Team 15 – Facility Safety Evaluations
        i. ANSI Z10 audit process should include: a) Progress in risk reduction, effectiveness in addressing underlying causes of risks and system deficiencies; b) Input from employees, status of corrective and preventive actions and changing circumstances; c) Follow-up action from audits and previous

management reviews; d) Extent to which objectives have been met; e) Performance of the system relative to expectations (pg 7).

e. Team 16 – Facility Review Assessment
    i. Safety-related recommendations from facility reviews should be transferred to DSIS safety module, but NOT the facility review module (pg 6).

3. Fixing safety concerns (n=4 items, 3 teams)

a. Team 2 – Implement Safety Policy (ANSI Z10)
    i. USBR is not providing necessary resources and training to implement SOH policies (pg 11).
b. Team 4 – Communications Plan
    i. Hold managers, supervisors, and employees accountable for ensuring the work environment is safe and healthy (pp 4-7).
    ii. Provide the necessary training and tools to accomplish Reclamation's work in a safe and healthy manner (pp 4-7).
c. Team 20 – Safety Design Process
    i. USBR needs to design facilities and equipment for safety and health by using a Prevention Through Design (PtD) process and team (pp ES2-4, 17-19).

D) How compare to Team 14 survey opinions?

Team 14 Survey – Quantitative and Likert-Scale Questions (n=21 survey questions grouped into 4 topics)

Responding to concerns and communicating upstream. In general, about half of FW, and slightly more GS, employees believed that their suggestions were encouraged and contributed to workplace safety, and that their workplaces had instituted safety programs and developed corrective action plans after incidents (Table 26). When considering the responsiveness of management to safety issues, FW workers tended to perceive their supervisors as more responsive than managers, but only half admitted that supervisors were consistently communicating their concerns upstream to managers. Most employees perceived managers as being responsive to the raised concerns, but not consistently. And only half of FW workers reported that managers communicate with them about safety issues.

Attention to (and understanding of) safety issues. 66% of PNR employees (compared to 77% for the agency) reported that their supervisors were paying the right amount of attention to safety issues. GS and SE employees were similarly positive about managers, but less than half of FW employees believed their managers were paying the right amount of attention. Nearly all employees believed that they understood safety risks in their workplaces, but were less confident about their coworkers' understanding. When considering the qualifications of people making safety decisions for the workplace, only half of PNR employees (55%) reported that those decisions were made by qualified people (compared to 64% for the agency). Within PNR, only 38% of FW employees (compared to 61% of GS employees) believed the decisions were made by qualified people.

Accountability. Only one third of FW employees (and half of GS) reported that managers were held accountable for unsafe workplaces. More employees in each group believed that supervisors were held accountable.

Workplace safety and maintenance. More employees in PNR (37%) reported unresolved workplace safety issues than were reported for the agency (27%). Two thirds (64%) of FW employees were aware of unresolved safety issues in their workplaces, compared to only a quarter of GS and SE employees. Most employees (71% of both GS and FW) reported adequate budgeting for safety equipment.
(NOTE: Survey data about specific work environments only included "office" and not the industrial, construction, or outdoor/onsite environments. Because the data were not available, we have not included the specific environmental concerns.)

Table 26. Understanding and Addressing Safety Concerns (Team 14 survey)

USBR Team 14 Survey Question		Responses Included	PNR (n = 721)	USBR (n = 3083)	Employee Type[a,b]
Responding to concerns and communicating upstream					
Q3.4_5	Employee suggestions contribute to making my workplace safer.	Agree	64%	65%	SE (100%) GS (66%) FW (57%)
Q5.3_2	Managers communicate with workers on safety issues.	Agree	75%	76%	SE (100%) GS (80%) FW (57%)
Q5.3_3	Managers respond to injuries, near misses and other safety issues.	Agree	72%	72%	SE (100%) GS (75%) FW (62%)
Q5.3_4	Managers are consistent in addressing safety issues.	Agree	61%	65%	SE (100%) GS (67%) FW (45%)
Q6.3_4	My supervisor consistently explains my safety concerns to management.	Agree	55%	58%	SE (100%) GS (57%) FW (50%)
Q6.3_5	My supervisor seeks my input on safety topics.	Agree	73%	71%	SE (100%) GS (73%) FW (69%)
Q6.3_7	My supervisor responds to injuries, near misses and other safety issues.	Agree	73%	75%	SE (100%) GS (74%) FW (70%)
Q6.3_9	My supervisor is consistent in addressing safety issues.	Agree	73%	74%	SE (100%) GS (74%) FW (65%)
Q10.1_2	My workplace develops corrective action plans after injuries, near misses or other incidents.	Agree	61%	61%	SE (80%) GS (65%) FW (51%)
Q10.1_6	My workplace's safety program addresses the risks I encounter on a day-to-day basis.	Agree	57%	61%	SE (80%) GS (60%) FW (50%)
Attention to (and understanding of) safety issues					
Q5.4	How much attention do managers in your region pay to safety issues?	About Right	66%	77%	SE (80%) GS (73%) FW (45%)
Q6.4	How much attention is your supervisor paying to safety issues?	About Right	82%	86%	SE (100%) GS (85%) FW (72%)
Q7.2_5	My coworkers understand the safety risks in our workplace.	Agree	83%	82%	SE (100%) GS (86%) FW (73%)
Q9.4_12	I understand the safety risks in my workplace.	Agree	91%	90%	SE (100%) GS (90%) FW (92%)
Q10.1_7	Safety decisions at my workplace are made by qualified people.	Agree	55%	64%	SE (100%) GS (61%) FW (38%)
Accountability					
Q5.3_6	Managers are held accountable for an unsafe workplace.	Agree	48%	53%	SE (80%) GS (54%) FW (33%)

USBR Team 14 Survey Question		Responses Included	PNR (n = 721)	USBR (n = 3083)	Employee Type[a,b]
Q6.3_8	My supervisor is held accountable for workplace safety.	Agree	65%	68%	SE (100%) GS (67%) FW (56%)
Workplace safety and maintenance					
Q3.4_8	My workplace has adequate budget for safety equipment.	Agree	71%	67%	SE (100%) GS (71%) FW (71%)
Q3.5	My workplace contains safety issues that have not been resolved.	Yes	37%	27%	SE (20%) GS (28%) FW (64%)
Q4.3_6	I am able to contact emergency services when working on site or in the field.	Agree	72%	68%	SE (80%) GS (68%) FW (78%)
Q10.1_9	Employees are encouraged to share new ideas on accomplishing their work more safely.	Agree	65%	66%	SE (80%) GS (68%) FW (55%)

[a] UNC analyzed the survey raw data to produce PNR-specific proportions for employee types.
[b] SE = Senior Executive; GS = General Schedule; FW = Federal Wage.

Team 14 Survey - Question 10.4: *"How would you improve your workplace's safety program?" (UNC analysis, n=38 of 201 comments, from 161 PNR respondents)*

Narrative comments focused mostly on the lack of support from safety staff and managers to address worker needs and implement safety solutions. Employees would like to see safety staff spend more time on worksites (both to understand the hazards that workers face and to help develop solutions). Comments suggested that managers de-prioritize safety solutions because of budgetary or production considerations, and that managers sometimes reject the recommendations or decisions of their safety staff. Safety Committees were perceived as generally discussing the safety concerns, but not making decisions or implementing solutions. Communication could also be improved by creating an easier process for employees to submit safety suggestions.

1. **Safety Staff are not meeting the need of workers (n=16)**
    a. Safety staff need time/experience in worksites in order to understand safety issues/hazards (n=7)
    b. Safety staff need to spend time in worksites to provide advice and help solve problems (n=4)
    c. Safety staff do not communicate with employees (n=2)
    d. Safety staff need to provide practical safety solutions (n=2)
    e. Safety staff do not have knowledge to answer worker questions about safety training (n=1)
2. **Managers do not prioritize safety solutions (n=13)**
    a. Budget considerations prevent implementation of safety solutions (n=4)
    b. Safety solutions are not implemented *(unspecified reason)* (n=4)
    c. Management counteracts decisions made by safety department (n=3)
    d. Production pressures prevent implementation of safety solutions (n=2)
3. **Safety Committees are not effective at making decisions and implementing solutions (n=7)**
4. **Need easier process for employees to submit safety suggestions (n=2)**

E) Relevant PNR initiatives

1. PNR's EEO staff are identifying whether and how to enhance the core/professional competencies for select positions (and these will then link to training opportunities)
2. PNR's EEO staff are conducting 360-evaluations to identify staff who could benefit from mentoring program

3. USBR Annual FEVP Survey to assess employee satisfaction (to provide managers and leadership with feedback)
4. Leadership training is in development
5. MESH or other supervisor training(s) are in development
6. PNR mentoring program

THEME #6: Coworker Relationships

Evidence across Data Sources (Triangulation)

UNC Summary Findings:	*Coworker Relationships*	
Coworkers are an important source of support for PNR workers trying to work safely, and 49% reported that coworkers help maintain safety in the workplace. However, PNR employees also reported that they cannot rely on coworkers when their skills, work ethic, or interpersonal relationship skills are perceived to be less than desirable for working in the industry's hazardous conditions. The major concerns with unsafe coworkers are related to underdeveloped work skills or poor work ethic, and the distraction they pose to other employees who must vigilantly monitor the coworker for risk-taking behaviors (purposeful or not).		
Other Data Related to Theme		
Data Source	**Alignment w/UNC Findings**	**Relevant Findings**
UNC Benchmark Interviews (n=2 of 8)	Unique contribution	When a supervisor or manager disciplines or commends an employee in front of other employees, that action becomes part of the coworker culture about how management treats employees. Organizations with a healthy coworker culture can more easily frame near-misses and lessons learned as a form of coworker protection.
USBR 21 Team Reports (n=2) *(#6, 8)*	Reinforces	Some employees fear coworker reprisal if they "stop work." Recommended promoting coworker collaborative efforts in creating a safe workplace.
USBR Team 14 Survey *(PNR compared to USBR, n=12 questions)*	Reinforces	PNR employees appreciate and rely on their coworkers' skills as a source of safety support. However, almost 25% of PNR employees work with (and can be influenced by) employees who take risks in order to complete their work.
USBR Team 14 Survey *(PNR narrative responses, n=10 of 201 comments)*	Reinforces and Enhances	Coworker safety should be a responsibility, but there is a cultural tradition at USBR of employees not intervening to modify risky behavior in coworkers.
Relevant PNR initiatives	Could help to address	• PNR 360 evaluation • PNR mentoring program

Theme Data

A) UNC Interviews

Interviewed employees discussed coworker relationships and the positive and negative influences from coworkers on safety in the workplace (Table 27).

Table 27. Coworker Relationships (UNC Interviews, n=96)

	PNR Percent	Important Differences across PNR[a]	
		Area[b]	Position[c]
1. Coworkers help improve safety on the job	49%		CT (87%), X (20%)
a. No authority to correct coworker unsafe behavior	6%		CT (13%)
2. Coworkers can inhibit safety			
a. They need mentoring to improve their job skills	26%		F (55%), X (10%)
b. They are a poor worker	26%	GC (48%)	
c. They have bad relationships with coworkers	24%		

[a] Blank cell means no important differences to report

[b] CC = Columbia-Cascades area, GC = Grand Coulee, SR = Snake River area, RO = PN regional office

[c] CT = craft/trade, F = foremen, M = managers, SS = safety staff, X = supervisors

Half of all interviews mentioned that coworkers help improve workplace safety because they "watch each other's backs" and provide a sense of supportive security when engaging in hazardous activities. This positive perspective was mentioned during most Craft/Trade interviews (87%). Not all coworkers feel empowered to correct coworker behaviors. For example, safety staff, and other employees who observe unsafe behavior, reported feeling that they have no authority to change a coworker's unsafe behavior. They can suggest, request or advise, but have no other recourse except to report it to a supervisor or call a "stop work."

However, almost 25% of interviews described skill-based and attitudinal reasons that some co-workers inhibit safety in the workplace. Any observable lack of skill or poor work ethic among coworkers can result in unsafe working conditions because either the coworker is taking risks or the employee is distracted while trying to monitor the unsafe coworker. These coworker concerns were expressed more often at Grand Coulee (48%), and were mentioned by more than half of foremen interviews (55%), but in only 10% of supervisor interviews.

B) Benchmark Interviews (n=2 of 8)

Two of the benchmark interviews indirectly addressed co-worker relationships in terms of a potential side-effect of disciplinary action, and in terms of how to frame near-miss reporting as a way to care for coworkers.

1. When a supervisor disciplines a worker, their words and actions will impact any coworkers who witness the interaction.
2. Reporting of near miss events can be encouraged as a protective strategy for coworkers (but this requires good coworker relationships).

C) Findings from the USBR 21 Teams (n=2 of 21)

One team (#6) made a recommendation about coworker "collaboration" to improve safety in the workplace. Another team (#8) reported that workers fear negative coworker reprisal if they stop work.

Team 6 – Strengthen SOH Commitment

1. Encourage positive peer-to-peer collaboration to create safe workplace (pp 29-31, Appendix D has a Supervisor Toolbox).

Team 8 – Trust and Cooperation

1. Some employees fear adverse reactions from coworkers and leadership if they stop work. Amend SAF 01-01.4C (between items 6 and 7) by inserting text that will support workers who use Stop Work (pp 21-22).

D) How compare to Team 14 survey opinions?

Team 14 Survey – Quantitative and Likert-Scale Questions

PNR survey responses for this topic were generally in the upper quartile of each scale (i.e., agreement, effectiveness, satisfaction, trust) and tracked closely to the results for the agency (Table 28). If almost one third of PNR workers are significantly influenced by their coworkers when developing their attitudes about safety (Q9.2_4), and almost a quarter of workers believe their coworkers take risks (Q7.2_1), this survey revealed the potential negative influence from coworkers on the safety culture.

Table 28. Coworker Relationships (Team 14 survey)

USBR Team 14 Survey Question		**Responses Included**	**PNR** (n = 721)	**USBR** (n = 3083)	**Employee Type**[a]
Q3.6	People in my workplace can report accidents or near misses without fear of reprisal from managers, supervisors or coworkers.	Agree	70%	76%	SE (100%) GS (74%) FW (58%)
Q7.1	How important to your coworkers are your top 3 workplace priorities when compared to safety?	Safety More Important	43%	37%	
Q7.2_1	My coworkers will take risks to complete a task.	Agree	22%	24%	SE (80%) GS (18%) FW (33%)
Q7.2_9	My coworkers would not judge me negatively for reporting a safety violation.	Agree	64%	68%	SE (100%) GS (68%) FW (50%)
Q7.2_2	My coworkers have received training on how to do their jobs safely.	Agree	78%	76%	SE (100%) GS (80%) FW (72%)
Q7.2_3	My coworkers have the qualifications, skill and knowledge to perform their jobs safely.	Agree	80%	81%	SE (100%) GS (83%) FW (71%)
Q7.2_5	My coworkers understand the safety risks in our workplace.	Agree	83%	82%	SE (100%) GS (86%) FW (73%)
Q7.2_6	My coworkers are comfortable asking for personal protective equipment, even when it is not offered.	Agree	79%	76%	SE (100%) GS (79%) FW (77%)
Q7.2_7	My coworkers are comfortable stopping work to avoid injury.	Agree	74%	74%	SE (100%) GS (76%) FW (66%)
Q7.2_8	My coworkers use personal protective equipment (PPE) at my workplace.	Agree	79%	71%	SE (80%) GS (79%) FW (76%)
Q9.2_4	My co-worker (is one of the top 3 factors influencing my attitude towards workplace safety).	Agree	30%	24%	SE (0%) GS (27%) FW (38%)

USBR Team 14 Survey Question		**Responses Included**	**PNR** (n = 721)	**USBR** (n = 3083)	**Employee Type**[a]
Q9.3_8	On a scale of one to ten, how important are the following in performing your job safely? - **Advice from co-workers**	Effective	82%	79%	SE (100%) GS (80%) FW (85%)

[a] SE = Senior Executive; GS = General Schedule; FW = Federal Wage

Team 14 Survey - Question 10.4: *"How would you improve your workplace's safety program?" (UNC analysis, n=10 of 201 comments, from 161 PNR respondents)*

Narrative responses suggest that because of a traditional culture of coworkers not correcting unsafe behaviors, PNR needs to foster a norm toward coworker responsibility for safety, especially if the agency is not promoting it.

1. Employees should be responsible for coworker safety, and encourage one another to work safely (n=8)
    a. Value of safety means being willing to stop your friend's work (n=1)
    b. USBR does not emphasize coworker safety (n=1)
    c. "Peer check" program lasted only 3 months (n=1)
2. USBR has a culture of coworkers not correcting risky behavior (n=2)

E) Relevant PNR initiatives

1. PNR's EEO staff are conducting 360-evaluations
2. PNR mentoring program

C. Components of the safety management system (SMS)

THEME #7: Employee Perceptions of Safety Staff

Evidence across Data Sources (Triangulation)

UNC Summary Findings:	*Employee Perceptions of Safety Staff*	
The role of Area/Regional safety staff is not well understood and is not fulfilling its potential within the safety management system. Safety staff in two Areas have used a compliance-focused style rather than a coaching/collegial style, and this has greatly diminished credibility and trust in their roles. Workers strongly recommend that safety staff in all Areas enhance their credibility through additional knowledge and skill training. Safety staff seem to perceive themselves as more knowledgeable and skilled than other employees perceive them. Craft/Trade workers mentioned CDSR staff who demonstrate the level of knowledge, skill, and dedication that workers consider to be important to the safety role. Craft/Trade workers believe that both Area and Regional safety staff need to visit worksites more often and develop relationships with employees. In comparison, many safety employees' perceptions of the quantity and quality of their visiting and employee relationships exceed workers' perceptions. Multiple workers requested a more proactive presence from safety professionals to identify safety concerns and potential mitigations, to help plan work and large-scale projects, and to alert the region to hazards as they are identified during investigations.		
Other Data Related to Theme		
Data Source	**Alignment w/UNC Findings**	**Relevant Findings**
UNC Benchmark Interviews (n=2 of 8)	Reinforces	Safety professionals need to use a coaching style, and not demonstrate a primary focus on compliance. Safety teams need to provide the workforce with supplemental information and resources, such as in-person trainings and injury data analysis. Safety managers need to function autonomously from management hierarchies in order to directly educate and influence the organization's leadership.
USBR 21 Team Reports (n=3) *(#2, 3, 8)*	Reinforces	Safety staff need training in interpersonal skills, and could benefit from a mentoring/shadowing program to learn from highly skilled colleagues with different expertise. Fully implement the CDSR program.
USBR Team 14 Survey *(PNR compared to USBR, n=4 questions)*	Reinforces	Management and workers have differing opinions of the effectiveness of safety staffs' advice, decisions, and training opportunities (with workers' opinions being less positive).
USBR Team 14 Survey *(PNR narrative responses, n=62 of 201 comments)*	Reinforces	The narrative comments focused on the perceived ineffectiveness, lack of skill, and poor responsiveness of safety staff. Several workers suggested that safety staff need to visit the work environments.
Relevant PNR initiatives	Could help to address	• Grand Coulee is developing a training plan for safety staff, and has initiated staff training • PNR mentoring program

Theme Data

A) UNC Interviews

Currently the role of PNR's regional and area safety staff is not well understood and is described as a weak contribution to the safety management system. In general, the workforce seemed to be aware of the potential for safety staff to contribute to workplace safety, however, many observed that current safety staff need further training and skill development. The analysis results are separated into Area safety offices (Columbia-Cascades, Grand Coulee, Snake River, application to all Areas) and then the Regional safety office.

Area Safety Offices
Employees shared their perceptions about the role, performance, credibility, and worksite visiting practices of Area safety staff (Table 29).

Table 29. Employee Perceptions of Area Safety Staff (UNC Interviews, n=96)

	PNR Percent	Important Differences across PNR[a]	
		Area[b]	Position[c]
1. Role of Area safety staff			
a. NEG: Unclear, unhelpful, doing the wrong thing	41%	GC (61%), SR (23%)	SS (92%), X (20%)
b. POS: Duties seem clear and appropriate	22%	SR (0%)	CT (10%), SS (58%), X (10%)
c. Should be restructured to have Regional oversight	16%	SR (3%), RO (54%)	SS (50%)
2. Performance of Area safety staff			
a. NEG: Not doing a good job	59%	CC (86%), SR (37%)	SS (83%), X (30%)
b. POS: Doing a good job	33%		SS (67%)
3. Understanding and knowledge of Area safety staff			
a. NEG: Not credibly trained, knowledgeable, skilled	28%	GC (42%)	CT (45%), M (13%), X (10%)
b. POS: Credibly trained, knowledgeable, skilled	15%		SS (58%)
4. Worksite visits by Area safety staff			
a. NEG: unhelpful, unwanted, not sufficient	30%		SS (50%)
b. POS: helpful, wanted, sufficient	19%		SS (58%)

[a] Blank cell means no important differences to report
[b] CC = Columbia-Cascades area, GC = Grand Coulee, SR = Snake River area, RO = PN regional office
[c] CT = craft/trade, F = foremen, M = managers, SS = safety staff, X = supervisors

Columbia-Cascades Area
Columbia-Cascades workers generally perceived the safety specialist as using a compliance-focused style which did not effectively provide assistance when workers were facing safety problems that needed strategic thinking and solutions. The safety staff is perceived as lacking in interpersonal skills to build relationships with the workforce. Most employees suggested that safety personnel should develop relationships with the workforce, and provide a range of safety services rather than focus solely on monitoring safety compliance. Some workers observed that the safety specialist is "in the field" with frequency (a positive observation), but his approach and purpose is perceived as antagonistic and not collaborative or mentoring toward safety. At the time of the UNC interviews, Columbia-Cascades was the only Area where Collateral Duty Safety Representative (CDSR) duties were assigned to employees. One CDSR worked in the Yakima Field Office locations in lieu of the safety staff. The CDSR employee reported needing supervisory assistance to limit his CDSR effort by managing the time demands of safety duties delegated from other staff.

One outlier to the safety staffing challenges in Columbia-Cascades is the Umatilla Field Office (UFO), where there seems to exist a culture of collaborative management built on strong interpersonal relationships. Employees noted that when the Area safety staff visits, the supervisor with CDSR responsibility is observed as

skillful in accompanying him and bridging his visit/audit focus to the workers and their tasks. Essentially the UFO CDSR provides a relationship filter or buffer which has allowed the Area safety staff to maintain a more positive reputation in that location.

Grand Coulee

For many workers at Grand Coulee, interactions with safety staff seem limited to hearing tests and respiratory equipment fit testing. Workers generally perceived the safety staff as neither credibly trained nor skilled for their jobs. Many workers were severely critical of the prior safety manager, whose compliance-focused style was harmful to the reputation of the safety group. By and large, safety staff were not perceived as engaging with the workforce to collaboratively develop solutions to safety problems. Employees also described how the prior safety manager would come to worksites and promise to obtain information or relay concerns to management, but apparently not follow through with those promised actions. This led to employee frustration with and dismissal of the usefulness of the safety team. Because "the trust was damaged a while ago" between the safety team and the workforce, many interviews discussed the need for safety staff to re-establish trust and rapport in order to rebuild their influence.

Many workers at Grand Coulee who discussed concerns with the planning of repairs or other work, expressed concern that no safety staff seem to be involved in the planning process, and that none of the current safety staff seem qualified to participate in that kind of work. Some workers described their own efforts to belatedly infuse safety considerations into project designs, but that was during the implementation phase (e.g., as repair projects were being planned and assessed for hazards). One such example was in the Third Power Plant (TPP), where the magnitude of the facility and its generation units increases the scale and duration of hazards faced by workers, such as excessive sound during some repair or maintenance tasks. Workers described how safety staff availability seemed too limited, and safety staff were not adequately involved in developing on-site mitigations to help protect workers. Some workers commented that safety staff were quick to call for Stop Work when hazards became apparent during the work activity, but that those delays could be avoided by proactively including safety staff during the planning phase.

These worker observations do not match Grand Coulee safety staff's perceptions of themselves. Some of them consider themselves highly trained, with extensive certifications for the work. Some mentioned spending between 25-50% of their workday interacting with workers on site. However, because of the scale of Grand Coulee's workforce, what might seem to safety staff as significant investment in relationship-building, might not be connecting with enough worker locations and settings to effectively counter the negative reputation of the safety staff.

UPDATE to Grand Coulee: With the appointment of a new safety manager, this group might be on the verge of significant cultural change with plans (and already some action) for staff training, mentoring by the safety manager, and systematic safety auditing of facilities – all based on a philosophy that values a human-centered approach. The new manager described his perception that safety staff and workers have been "starved" for collaborative guidance regarding safety concerns.

Snake River Area

In Snake River, perceptions about the two safety staff varied with one considered more credible and exhibiting a more professional style. Neither safety staff is recalled as visible enough in the field to be considered a significant resource to the workforce. The Upper Snake safety staff is perceived as having "retreated" from the field due to some early training and facilitation missteps. The Middle Snake safety staff is perceived as being pulled too frequently into Regional administration matters or safety concerns with the office facilities in the Boise location. Some workers commented that when the safety staff did come on site they would conduct a safety spot check, but would fail to observe the Craft/Trade employees' work: "We do some amazing things in the field that they should see . . . to learn more about our work!" Similar to Grand Coulee, there is some

disconnect between the perceptions of safety staff (more positive) and the workforce (less positive) in terms of the amount of time safety staff spend visiting worksites, their ability to follow-up on promised action steps, and their knowledge about the Craft/Trade jobs.

Applies to All Areas

Organizational Structure for Safety. Some interviews (16%) at each professional level (and 50% of safety staff) suggested that Area safety staff should be managed by the Regional Office. Further elaboration revealed concern about the potential conflicting priorities when Area managers (responsible for ensuring the delivery of water and power to customers) are also supervising the workforce safety personnel (responsible for auditing, investigating, and helping improve hazardous work environments, even if that requires stopping or delaying operations).

CDSR. Collateral Duty Safety Representatives are members of the workforce who are assigned a portion of their job duties as representatives of the safety program. Columbia-Cascades Area managers consider the appropriate division of work duties for CDSR personnel to be 80% on their primary work activities, and 20% on CDSR assignments. Because of the effectiveness of the CDSR role in the Yakima Field Office, the Area is piloting CDSR assignments in some of their remote locations to obtain the potential benefit from a dedicated safety presence. In Upper Snake Field Office, the CDSR program is not used, but each facility has a dedicated "safety contact" who collaborates with the Area safety staff. There is some confusion among both Regional and Area workforces as to whether the CDSR program is voluntary or assigned, and whether it is merely a pilot program or an approved mechanism for enhancing safety presence. For example, one employee at Grand Coulee mentioned that CDSR had been used in the past, and was considered a "great program," but was uncertain of its current status in Coulee. Some managers described the lack of support from peers who perceive CDSR employees as being distracted from their "real job."

Summary

Although there is currently confusion about the role of safety staff and concern about their performance, there seems to be interest in improving the capability of this aspect of the safety management system. Even some of the safety staff recognized that their role needs development and guidance, and that their skill level could be enhanced with additional training and mentoring. This potential seemed most obvious at Grand Coulee.

Regional Safety Office

Employees shared their perceptions about the role, performance, credibility, and worksite visiting practices of Regional safety staff (Table 30).

Table 30. Employee Perceptions of Regional Safety Staff (UNC Interviews, n=96)

	PNR Percent	Different from Region %	
		Area	Position
1. Role of Regional safety staff			
a. NEG: Unclear, unhelpful, doing the wrong thing	11%	RO (54%)	SS (50%)
b. POS: Duties seem clear and appropriate	16%	RO (69%)	SS (83%)
2. Performance of Regional safety staff			
a. NEG: Not doing a good job	25%	RO (62%)	SS (75%)
b. POS: Doing a good job	16%	RO (62%)	SS (67%)
3. Understanding and knowledge of Regional safety staff			
a. NEG: Not credibly trained, knowledgeable, skilled	11%	RO (31%)	--
b. POS: Credibly trained, knowledgeable, skilled	7%	RO (46%)	SS (42%)
4. Worksite visits by Regional safety staff			
a. NEG: unhelpful, unwanted, not sufficient	15%	RO (54%)	SS (50%)
b. POS: helpful, wanted, sufficient	11%	RO (54%)	SS (58%)

The lack of visibility of the Regional safety manager among the workforce, and confusion about the role of the Regional safety staff, has diminished their perceived potential as a resource among the workforce. The issue is not the level of training or credentials, rather a lack of awareness of the group's contribution. Some workers perceived the lack of visibility as due to "turf" clashes with Area safety staff, resulting in Regional safety staff excluded from providing services or guidance. Employees also expressed some concern with the perceived drift toward a mainly "reactive" style of managing the Regional safety program. Workers who commented on the reactive management style cited examples when incidents occurred and either the information seemed rushed to dissemination without enough detail to be useful (e.g., Yellow Alerts) or the information was delayed for too long (e.g., no 24-hour alert about incident; many weeks or even months without any update; and sometimes no final summary of relevant findings and lessons learned).

Regional safety staff reported engaging in self-assessment to consider how to improve their products and services. However, both regional and Area employees questioned whether the Regional safety employees have enough relationships in each location to be adequately familiar with what is needed from the safety program.

B) Benchmark Interviews (n=2 of 8)

Two of the more experienced safety officers at the benchmark organizations discussed the ideal characteristics of safety staff and safety managers. In general, safety staff should use a coaching style of interaction with the workforce, and provide supplemental resources to the organization such as live safety training and data analysis/interpretation. Safety managers should function autonomously from the management hierarchies, and should be empowered to educate Leadership when necessary and appropriate.

Safety Staff

1. Safety professionals' style should be coaching and facilitative (i.e., "compliance is NOT a style").
2. Safety professionals' role should be to:
    a. Guide and counsel workers in the field
    b. Help interpret compliance issues
    c. Provide instructor-led training
    d. Analyze the data from incidents and provide interpretation to Leadership

Safety Manager

1. Safety manager needs to report to the highest level in the organization.
2. Safety manager has to help educate the Leadership, and this means letting them know what they don't know (and that is tricky). This can frequently happen during incident investigations.

C) Findings from the USBR 21 Teams (n=3 of 21)

Three of the USBR teams (#2, 3, 8) suggested training/mentoring the safety staff (including using a shadowing/mentoring program) to more effectively fulfill their duties. They also suggested fully implementing the CDSR program to augment the presence of safety staff in some facilities.

Team 2 – Implement Safety Policy (ANSI Z10)

1. SOH personnel are not adequately analyzing injury and illness reports/data to ensure countermeasures are developed (pg 11).
2. Develop USBR training for safety staff to learn interpersonal skills such as communication, and collaboration (pg A5).
3. Use a marketing blitz via PIO messaging to describe SOH staff support service and expertise (pg A5).

Team 3 – Survey for Effective Use of SOH Staff

1. Initiate a rotational safety-shadowing program to increase effectiveness of safety staff to develop/implement a safety program, or rotate established fulltime SOHs as on-site trainers with different expertise to offer (pg 6).

Team 8 – Trust and Cooperation

Fully implement collateral duty safety officer program, and use DOI Manual 485 28.3 to determine how and where CDSR should be assigned (pg 19).

D) How compare to Team 14 survey opinions?

Team 14 Survey – Quantitative and Likert-Scale Questions

The survey questions pertaining to safety staff suggest that although most employees know how to contact their safety office, they do not agree on the level of effectiveness of the safety staff's advice, decisions, and promotion of training opportunities (Table 31). In general, PNR was less satisfied than the other regions. And the satisfaction varied by type of worker, with all the surveyed senior-level managers reporting being satisfied with advice and decisions. In contrast, 61-67% of GS employees and only 38-53% of FW employees (a proxy for Craft/Trade workers) were satisfied with the advice and decisions. These findings support the critique of the PNR safety professionals heard during the UNC interviews.

Table 31. Employee Perception of Safety Staff (Team 14 survey)

USBR Team 14 Survey Question		**Responses Included**	**PNR** (n = 721)	**USBR** (n = 3083)	**Employee Type**[a]
Q9.3_7	On a scale of one to ten, how important are the following in performing your job safely? - **Advice from the safety office**	Effective	62%	69%	SE (100%) GS (65%) FW (50%)
Q10.1_5	I know how to contact the safety office in my workplace.	Agree	86%	86%	SE (100%) GS (88%) FW (81%)
Q10.1_7	Safety decisions at my workplace are made by qualified people.	Agree	55%	64%	SE (100%) GS (61%) FW (38%)
Q10.1_8	My workplace safety professional makes safety information and training opportunities available to me.	Agree	60%	68%	SE (80%) GS (67%) FW (37%)

[a] SE = Senior Executive; GS = General Schedule; FW = Federal Wage

Team 14 Survey - Question 10.4: *"How would you improve your workplace's safety program?" (UNC analysis, n=62 of 201 comments, from 161 PNR respondents)*

The most frequent narrative comments further articulate the challenges with Safety staff, and the concerns with credibility and the organizational structuring of the safety personnel.

1. **Safety Staff (n=50)**
    a. Ineffective and don't seem qualified for the job (n=31; 9 supervise employees)
    b. Need to be visible, visit work environments to communicate with the workforce, attend safety meetings, and better understand the jobs and their hazards (n=9; 4 supervise employees)
    c. Not responsive to requests about safety concerns and training needs; not providing safety coaching/guidance (n=4)

d. Should not report to facility management (n=4; 1 supervises people)
e. Recently lost our Collateral Duty safety officer (n=1)
f. Need to hire more safety staff so they can increase outreach capacity (n=1)

2. Safety Committees (n=12)

a. Ineffective because fail to make decisions or take action (n=7; 1 supervises people)
b. Too much turnover, lack of leadership, and need more Trade representation (n=5; 1 supervises people)

E) Relevant PNR initiatives

1. Grand Coulee: UNC heard that a training plan for the safety staff was being developed, and that staff training had been initiated. *(NOTE: In 2014 the U.S. Department of Interior published a list of competencies (and training opportunities) for safety staff.)*
2. PNR mentoring program

THEME #8: Safety Committees

Evidence across Data Sources (Triangulation)

UNC Summary Findings:	*Safety Committees*
Half of interviews discussed safety committees and frequently expressed frustration with the lack of progress or decisive action by the group. When considering the function of the safety committee, "discussion" was frequently mentioned in both positive and negative terms. Opinions were divided between those considering the discussion to be appropriate (27%) because it facilitated networking and communicated across multiple levels of the organization, and those believing the discussions were ineffective (18%) at communicating sufficiently with workers and securing the needed information. Twice as many interviews thought the safety committees were ineffective (24%) as thought they were effective (11% - mostly supervisors and safety staff). The lack of agreement about committee function and effectiveness suggests a misalignment and lack of clarity about the purpose, goals, and authorities of safety committees. Members seem to have their own reasons for serving/attending and might not have a shared understanding of what will be accomplished. Therefore, each comes away with varying opinions about the effectiveness of such committees.	

Other Data Related to Theme		
Data Source	**Alignment w/UNC Findings**	**Relevant Findings**
Benchmark Interviews (n=1 of 8)	Enhances	A supervisor chairs the local safety committee, and the role of committee chair is considered part of the supervisor's job.
USBR 21 Team Reports (n=4) *(#2, 6, 8, 9)*	Reinforces	Safety committee membership should represent affected locations, disciplines, and organizational units, and management should participate to increase leadership engagement. Meeting minutes should be shared with staff for transparency. Committee duties should focus on discussing and coordinating resolution of safety issues. Safety committees could also be involved in program/procedure approval, incentive program development, and near miss/incident discussion and dissemination.
USBR Team 14 Survey *(PNR compared to USBR, n=2 questions)*	Reinforces	Most workplaces have safety committees, but only half of GS and FW employees believe safety committees are effective in making workplaces safer.
USBR Team 14 Survey *(PNR narrative responses, n=17 of 201 comments)*	Reinforces and enhances	Safety committees discuss safety issues, but are not always effective in implementing solutions. Employees would like more communication on what safety committees do and how to contact them. Some committees suffer from membership attrition. Committees need to include craft/trade representatives and employees with the technical/procedural knowledge to guide discussion of safety issues.
Relevant PNR initiatives	--	• *(Not aware of any)*

Theme Data

A) UNC Interviews

Half (49%) of interviews discussed safety committees, with most of them referring to their Area safety committee (Table 32).

Table 32. Safety Committee (UNC Interviews, n=96)

	PNR Percent	Important Differences across PNR[a]	
		Area[b]	Position[c]
Safety committee	49%	CC (68%), GC (32%)	SS (67%)
1. Comments about Area safety committee	46%	CC (64%), GC (29%)	SS (67%)
2. Role of safety committee	34%	CC (59%)	F (18%), SS (67%)
3. Safety committee communicates enough	27%	CC (45%), GC (10%)	F (9%)
4. Safety committee does not communicate enough	18%		SS (42%)
5. Safety committee is effective	11%		X (30%), SS (33%)
6. Safety committee is not effective	24%		SS (42%)

[a] Blank cell means no important differences to report

[b] CC = Columbia-Cascades area, GC = Grand Coulee, SR = Snake River area, RO = PN regional office

[c] CT = craft/trade, F = foremen, M = managers, SS = safety staff, X = supervisors

When mentioning the membership on their committee, most employees tended to reference either their own membership or representation by colleagues at their same level in the organization (Craft/Trade, supervisor, manager).

Interviews described the function of Area committees, and tended to emphasize the discussion of safety issues and incidents, the development of policies/procedures, and assistance with larger project planning. The focus on "discussion" was frequently criticized as bordering on inaction. A couple of interviewees explained that they stopped serving on the committee because it made no decisions and took no action. Slightly more than one quarter (27%) of interviews believed that the amount of discussion was appropriate because it facilitated networking across the organization, gathered necessary input on a topic, and communicated with both managers and workers. However, multiple interviews (18%) disagreed, and suggested that the communication is ineffective and fails to gain needed input on topics, and this is partly because the committee fails to communicate sufficiently with workers.

Twice as many workers believe the safety committees are not effective (24%) as think they are (11%). The indictment for poor effectiveness was fairly uniform across the organizational Areas and positions, while almost three times as many supervisors and safety staff believed in the effectiveness of the committees as did the others. The lack of agreement about committee function and effectiveness suggests a misalignment and lack of clarity about the purpose, goals, and authorities of safety committees.

Members seem to have their own reasons for serving/attending and might not have a shared understanding of what will be accomplished. Craft/Trade workers might be frustrated that their concerns do not gain decision or action by Committees (which would become recommendations to management to address the safety issues). Managers seem to recognize that the Committees are not functioning as effectively or powerfully as they could, but have failed to make any adjustments. The supervisors and safety staff might gain the most information and communication leverage (dialogue) across organizational levels during committee meetings, and, therefore, perceive the meetings as effective and helpful to their purpose of facilitating an exchange of information. The result is that each occupational representative comes away with a different opinion about the effectiveness of safety committees.

B) Benchmark Interviews (n=1 of 8)

Safety committees were not routinely explored during benchmark interviews, but one participant mentioned as supervisor he chairs the local safety committee. The role of committee chair is now part of the supervisor's job.

C) Findings from the USBR 21 Teams (n=7 items, 4 teams)

Four teams provided recommendations related to safety committees, with Team 8 developing explicit guidance ideas for committees.
Three teams (#2, 6, 9) recommended that safety committees have specified tasks to accomplish, including: approval of programmatic guidance and office procedures; development and administration of safety incentive programs; and discussion and dissemination of near miss and incident information.
Team 8 suggested multiple recommendations to enhance safety committee process (i.e., membership, meetings, duties) with implementation to be supported by modifying D&S SAF 01-01 and 01-06. In addition, committee process could be standardized with a specific committee section in the future-planned USBR pocket guide. Recommendations included that committee membership be representative of all relevant locations, disciplines, and organizational units. Meetings should be regularly scheduled, and minutes shared with staff for transparency. Committee duties should support the coordinated resolution of safety issues, rather than conduct/participate in facility inspections. Team 8 also recommended that management participate on safety committees to help develop solutions and increase leadership's engagement with safety.

1. Team 2 – Implement Safety Policy (ANSI Z10)
    a. Include safety committee approval in the approval process for programmatic guidance and office procedures (pg A7).
2. Team 6 – Strengthen SOH Commitment
    a. Employee committees should participate in developing and/or administering SIPs [Safety Incentive Programs] including developing criteria and selecting award items (pg 9).
3. Team 8 – Trust and cooperation
    a. Management should participate on safety committees and help develop solutions (pg 18).
    b. Implement effective safety committees (pg 25).
    c. Modify the D&S SAF 01-01 and SAF 01-06, and include guidance on safety committees in a USBR pocket guide (pp26-28).
4. Team 9 – JHA Process Evaluation
    a. Hold a post-job review meeting within 7 days of work completion to revise the JHA and capture lessons learned which would be disseminated via Safety Committee members. Supervisor XE 2nd level review any near miss, incident or accident prior to project close out (pg 9).
    b. Local safety committees will discuss near-misses, incidents, and accidents and disseminate related information as appropriate (pg 13).

D) How compare to Team 14 survey opinions?

<u>Team 14 Survey – Quantitative and Likert-Scale Questions</u>

Only two questions in the Team 14 survey related to safety committees. Almost three quarters (71%) of PNR respondents reported that their workplaces had safety committees (Table 33). However, while all senior executives stated that safety committees made their workplaces safer, only about half of GS and FW employees agreed. This suggests that management and non-management employees might judge committee effectiveness differently (with FW and GS basing their judgement on observable impact in workplaces).

Table 33. Safety Committee (Team 14 survey)

USBR Team 14 Survey Question		**Responses Included**	**PNR** (n = 721)	**USBR** (n = 3083)	**Employee Type**[a,b]
Q10.2	My workplace has a safety committee.	Yes	71%	67%	SE (80%) GS (70%) FW (75%)
Q10.3	The safety committee helps makes my workplace safer.	Yes	57%	66%	SE (100%) GS (59%) FW (50%)

[a] UNC analyzed the survey raw data to produce PNR-specific proportions for employee types.
[b] SE = Senior Executive; GS = General Schedule; FW = Federal Wage.

Team 14 Survey - Question 10.4: *"How would you improve your workplace's safety program?" (UNC analysis, n=17 of 201 comments, from 161 PNR respondents)*

Narrative comments focused on the effectiveness of safety committees in moving from discussion to action, with several comments expressing frustration at the seeming inertia of the committees. Employees might need better access to basic information about their safety committee. Staff turnover makes it difficult to maintain membership consistency, and this can negatively impact committee effectiveness and communication. Committees should have a membership that represents all the Craft/Trade departments in the service location. During the investigation process, committees should consult with knowledgeable employees to gain their opinion about the avoidability of the incident.

1. Safety committee discusses safety issues, but does not implement solutions (n=7)
2. Employees need to receive more information on safety committee activities and how to contact committee (n=3)
3. Safety committee membership is inconsistent due to staff attrition (n=3)
4. Safety committees should have members from each craft or trade department (n=2)
5. Safety committee should seek input from knowledgeable employees before attempting to investigate or remediate hazards that might be unavoidable (n=1)
6. Management should hold workers accountable for procedure violations instead of assigning safety committees to investigate procedures (n=1)

E) Relevant PNR initiatives

1. (Not aware of any)

THEME #9: Safety Training

Evidence across Data Sources (Triangulation)

UNC Summary Findings:	*Safety Training*	
Workers think that additional safety training is needed for new employees who might not be familiar with the specific hazards in the facilities. Such training could be further enhanced with job "shadowing" or mentoring, especially for new Craft/Trade and Supervisors. The PNR workforce experiencing safety trainings for their jobs are seeking trainings that are more tailored to their job activities and context. PNR needs a training database to monitor employee training/certification requirements. Employees mainly want to learn via hands-on instruction, interactive methods, demonstrations, and visual aids. They also request shorter training sessions (e.g., the Safety Training Week was uniformly described as too long). Instructors need to be content knowledgeable, experienced in the work of their audience, and educationally skillful (currently too few safety staff exhibit this level of training credibility).		
Other Data Related to Theme		
Data Source	**Alignment w/UNC Findings**	**Relevant Findings**
UNC Benchmark Interviews (n=4 of 8)	Reinforces and enhances	Training needs to be tailored to workers' jobs and learning styles. Large organizations can develop Core content, with additional job-specific modules that include situational complexity. Employees need to practice decision-making in simulated scenarios that mimic real-life timeframes and stressors. The U.S. military produces some highly-skilled trainers.
USBR 21 Team Reports (n=10) *(#2, 3, 4, 8, 9, 10, 11, 17, 18, 19)*	Reinforces	Trainings should deliver administrative content (e.g., job responsibilities), technical content (e.g., JHA, safety policies, hazard recognition/communication), and inter-personal skills. Safety staff need more training, and could benefit from mentoring programs with highly experienced safety personnel. Consider creating the position of "Training Officer" to deliver trainings. PNR needs a database to monitor employee training needs.
USBR Team 14 Survey *(PNR compared to USBR, n=8 questions)*	Reinforces and enhances	Some PNR employees understand the safety risks inherent in their jobs, but have not been adequately trained to address those risks (and the outcomes might be worse for FW employees with risk-taking coworkers). Workers do not believe that safety staff are providing the information and training opportunities that would benefit workers in their jobs.
USBR Team 14 Survey *(PNR narrative responses, n=28 of 201 comments)*	Reinforces	Narrative comments focused on the need for job-specific and high-quality trainings, with a tracking database to monitor training/certification requirements of employees.
Relevant PNR initiatives	Could help to address	• Leadership training is in development • MESH or other supervisor training(s) • Regional safety program hired an employee to develop and maintain a database that will track the required trainings and certifications for all employees, and to help develop new safety trainings.

Theme Data

A) UNC Interviews

All but a few of the UNC interviews discussed the subject of safety training, and many made suggestions or recommendations for improvement (Table 34).

Table 34. Safety Training (UNC Interviews, n=96)

	PNR Percent	Important Differences across PNR[a]	
		Area[b]	Position[c]
1. Training content suggestions	46%		
a. Topics for training	30%		SS (50%)
2. Instructor suggestions	31%	GC (10%)	F (9%), SS (50%)

[a] Blank cell means no important differences to report

[b] CC = Columbia-Cascades area, GC = Grand Coulee, SR = Snake River area, RO = PN regional office

[c] CT = craft/trade, F = foremen, M = managers, SS = safety staff, X = supervisors

Training Content. Nearly half (46%) of the interviews discussed the content of safety training. A common theme was the need for trainings to be more directly relevant to participants' jobs, rather than consisting of only generic or required information. Increased safety-related training was recommended for new employees to improve their ability to identify safety hazards in their jobs and work locations (i.e., equipment, facilities). Additional training was also recommended for newly promoted managers, and focused mainly on the need for training in interpersonal skills and administrative tasks (such as scheduling and the use of data systems).

Instructor Skills. One third of interviews discussed the skills necessary for instructors, including: knowledge of the subject matter, instructional/teaching methods, and work experience in the job that is the focus of the training.

Safety Staff as Trainers. Most of the interviewees who had observed trainings by Area or Regional safety staff were critical of their knowledge-base and their instructional skills. Safety staff were reported to not adequately follow through on promises to deliver trainings that would address current and pressing safety needs. Some workers praised safety staff who had arranged for external, well-respected instructors from other Areas or Regions (or even outside the agency) to deliver technical information in an engaging style.

Training Methods. Training methods were also discussed with hands-on instruction most frequently recommended, followed by interactive methods, live demonstrations, and visual materials. On-the-job learning through shadowing and mentoring was also recommended for both Craft/Trade workers and supervisors.

Training Schedule. Craft-Trade workers expressed a desire for shorter training sessions with more frequent refresher or "booster" trainings. A week-long safety training experience was described by interviewees in some Areas as too challenging a schedule to produce effective learning outcomes. The actual training schedule should fit more conveniently into employees' work schedules.

Training Database. Many workers were critical of the Regional and Area safety staff's collective inability to track training requirements for the workforce ("isn't that their job?") in order to ensure that workers' certifications do not expire. Multiple employees were aware of Excel spreadsheets being developed over extended periods of time at either Area or Regional safety offices, but which were considered ineffective because they failed to produce the needed service. Foremen, supervisors, and managers expressed the need for improving PNR's training tracking system to more effectively inform employees about their training/certification needs.

B) Benchmark Interviews (n=4 of 8)

Four benchmarking interviews discussed the subject of training. Of these, two stated that training should be tailored to align closely with workers' jobs and their preferred learning styles. One interview recommended providing everyone with core training on basic skills, and then adding situational complexity that aligns with the specific job function (i.e., Craft/Trade, foreman, supervisor, manager). Another recommended using simulated job situations to help employees practice decision-making within the timeframes and under the stress they would experience in their real job. The simulations help instructors identify poor work skills that need retraining. Other recommendations included the use of in-person training, and the hiring of trainers with military training experience who could bring to PNR the high-quality training methods used in the military.

1. Trainings should be tailored to participants' work and learning styles.
    a. Trainings should be designed to deliver base-level skills, then add situational complexity.
    b. DOI Learn trainings need to be tailored to be applicable to participants' work.
    c. Training should incorporate multiple learning options to adapt to participants' learning styles.
2. Experiential training is beneficial for simulating job situations that require decisions and for identifying bad skills/practices that need to be unlearned.
    a. "Help them learn to think before they go."
3. Hiring training managers from the military can bring military-quality training to an organization.
4. In-person training is better.

C) Findings from the USBR 21 Teams (n=35 items, 10 teams)

Ten of the 21 teams provided a total 35 findings/recommendations on the subject of Training.
Six teams listed specific subjects that training should cover, including hazard recognition and communication; safety policies and regulations; the JHA process; and the roles of supervisors, managers, and safety staff. Three teams recommended specific training packages (e.g., MESH training, DuPont STOP).

Six teams recommended additional training for supervisors, especially in communication skills to more effectively discuss safety with employees. Other supervisor skills in need of training included: incident investigation, hazard recognition and mitigation, and motivational methods. Three teams recommended additional training for safety staff, especially a rotating mentoring or training program for safety staff that paired safety staff with more seasoned and expert colleagues. Additionally, they suggested a standardized training for the collateral duty safety representative program (CDSR).

On the subject of training systems, three teams recommended developing a system to track required and current training, and one team recommended appointing Training Officers to track and deliver trainings.

1. Training topics (n=15 items, 6 teams)

a. Provide training on hazard recognition/communication (n=3 items, 2 teams)

i. Team 8 – Trust and Cooperation
    1. Dupont STOP training is a model program designed to provide safety awareness, observation skills, and communication skills among employees (pg 31).

ii. Team 10 – Acquisition Safety Review
    1. Hazard communication training should be annual (pg 17).
    2. Develop and provide awareness training courses to employees about purchasing items that may cause a safety hazard. This training could include an overview of OSHA, RSHS requirements, guides, lists, and references that are available (pg 9).

b. Provide training on JHA process (n=4 items, 1 team)

i. Team 9 – JHA Process Evaluation
    1. Require every 3 years a training refresher on RSHS Section 4 and JHA (pp 12-13).

2. Training on any revisions to the JHA process should be part of employee and supervisor trainings (pp 12-13).
3. Develop and provide training on Job Hazard Recognition and Mitigation, and include in employee and supervisor trainings (pp 12-13).
4. USBR should better define JHA expectations and provide improved training and guidance in their preparation, including hazard recognition skills (pg 3).

c. Provide necessary safety training (n=3 items, 3 teams)

i. Team 2 – Implement Safety Policy (ANSI Z10)
   1. USBR is not providing necessary resources and training to implement SOH policies (pg 11).

ii. Team 4 – Communications Plan
   1. Provide the necessary training and tools to accomplish Reclamation's work in a safe and healthy manner (pp 4-7).

iii. Team 17 – Employee Safety Training
   1. Safety Training 101 (RST) has been planned and is in development. It will not replace job-specific trainings (pg 3).

d. Provide training on safety policies and regulations (n=3 items, 2 teams)

i. Team 9 – JHA Process Evaluation
   1. Require every 3 years a training refresher on RSHS Section 4 and JHA (pp 12-13).

ii. Team 10 – Acquisition Safety Review
   1. Develop and provide awareness training courses to employees about purchasing items that may cause a safety hazard. This training could include an overview of OSHA, RSHS requirements, guides, lists, and references that are available (pg 9).
   2. Conduct instructor led MSDS, RSHS, and OSHA trainings to contract specialists, CORs and COTRs to acquaint them with safety regulations and policies. Conduct refresher courses to update as new policies or regulations are created (pg 9).

e. Provide training on job roles (n=2 items, 1 team)

i. Team 2 – Implement Safety Policy (ANSI Z10)
   1. Include in a MESH training, information about the role of supervisors and managers, and compare to the role and responsibilities of SOH staff (pg A5).
   2. Use a marketing blitz via PIO messaging to describe SOH staff support service and expertise. (pg A5)

2. Roles in need of training (n=12 items, 6 teams)

a. Additional training for Supervisors (n=6 items, 6 teams)

i. Train in safety communication (n=3 items, 3 teams)

1. Team 8 – Trust and Cooperation
   a. Dupont STOP for Supervision is a program designed to enable constructive discussions with employees about safe and unsafe work practices (pg 31).
2. Team 11 – Information Sharing Plan
   a. Supervisors need training to solicit employee input on safety such as "real life" stories. Training should include active listening skills and inquiry methods (pg 2).
3. Team 17 – Employee Safety Training
   a. Team 17 developed a checklist for supervisors to help them facilitate one-on-one safety discussions. Can also be used with new employees (pg 4).

ii. Train in other skills (n=3 items, 3 teams)

1. Team 2 – Implement Safety Policy (ANSI Z10)
   a. Supervisors need to be trained in incident investigation techniques so they avoid "pro forma" investigations (pg A4).
2. Team 9 – JHA Process Evaluation
   a. Develop and provide training on Job Hazard Recognition and Mitigation, and include in employee and supervisor trainings (pp 12-13).
3. Team 18 – Supervisor Safety Training
   a. Developing the MESH Training which is anticipated to address motivating practices of Supervisors (pg 12).

b. Additional training for Safety Staff (n=6 items, 3 teams)

i. Training for CDSR position (n=3 items, 2 teams)

1. Team 3 – Survey for Effective Use of SOH Staff
   a. Establish a formal SOH/CDSR training program (developed for USBR safety personnel) (pg 6).
   b. USBR Safety Council should collaborate with HR to develop model language for a CDSR position description including duties, % time for each duty, trainin required within the Individual Development Plan (pg 5).

2. Team 8 – Trust and Cooperation
    a. Fully implement Collateral Duty Safety and Health Officer training (pg 19).

ii. Mentoring or rotational training for Safety Staff (n=2 items, 1 team)

1. Team 3 – Survey for Effective Use of SOH Staff
    a. Initiate a rotational safety-shadowing program to increase effectiveness of safety staff to develop/implement a safety program, or rotate established fulltime SOHs as on-site trainers with different expertise to offer (pg 6).
    b. Initiate a safety mentoring program by listing the safety professionals with their areas of expertise (pg 6).

iii. Train Safety Staff in interpersonal skills (n=1 item)

1. Team 2 – Implement Safety Policy (ANSI Z10)
    a. Develop USBR training for safety staff to learn interpersonal skills such as communication and collaboration (pg A5).

3. Training systems (n=4 items, 3 teams)

a. Develop training tracking system (n=3 items, 3 teams)

i. Team 2 - Implement Safety Policy (ANSI Z10)
    1. Develop a tracking system or process to ensure training and medical monitoring reflect current information. Create database to track required trainings by job classification and activity, and provide reminders to supervisors for needed training (pg A6).

ii. Team 9 – JHA Process Evaluation
    1. Identification of required training and confirmation of currency with employees (pp 4-5).

iii. Team 19 – Safety Training Tool
    1. DOI's Learning Management System (LMS) can identify training needs, and link specific course catalog entries to specific employees. LMS can notify both employee and supervisor of training needs, and can send status updates to supervisors (pg 1).

b. Use Training Officers to coordinate training (n=1 item, 1 team)

i. Team 2 - Implement Safety Policy (ANSI Z10)
    1. Coordinate training needs through Training Officers to improve the quality of the training and contract for multi-site training from one provider (pg A6).

4. Recommendations about specific training packages (n=4 items, 3 teams)

a. Dupont STOP (n=2 items, 1 team)

i. Team 8 – Trust and Cooperation
    1. Dupont STOP for Supervision is a program designed to ehable constructive discussions with employees about safe and unsafe work practices (pg 31).
    2. Dupont STOP training is a model program designed to provide safety awareness, observation skills, and communication skills among employees (pg 31).

b. MESH training (n=2 items, 2 teams)

i. Team 2 - Implement Safety Policy (ANSI Z10)
    1. Include in a MESH training, information about the role of supervisors and managers, and compare to the role and responsibilities of SOH staff (pg A5).

ii. Team 18 – Supervisor Safety Training
    1. Developing the MESH Training which is anticipated to address motivating practices of Supervisors (pg 12).

D) How compare to Team 14 survey opinions?

<u>Team 14 Survey – Quantitative and Likert-Scale Questions</u>

Eight questions on the Team 14 survey were related to training (Table 35). One finding is that PNR employees report understanding the safety risks inherent in their jobs, but less than 75% of them report being trained to address those safety risks. The issue is further complicated because FW employees score their coworkers' training, qualifications, skill, and knowledge lower than do the GS and SE employees. This means that Craft/Trade workers who already face substantial hazards, and then work with risk-taking coworkers, might be less comprehensively trained to address those risks.

Survey respondents' opinions varied widely regarding whether safety professionals provide information and training opportunities, with only 37% of FW employees responding favorably.

Table 35. Safety Training (Team 14 survey)

USBR Team 14 Survey Question		**Responses Included**	**PNR** (n = 721)	**USBR** (n = 3083)	**Employee Type**[a,b]
Q7.2_2	My coworkers have received training on how to do their jobs safely.	Agree	78%	76%	SE (100%) GS (80%) FW (72%)
Q7.2_3	My coworkers have the qualifications, skill and knowledge to perform their jobs safely.	Agree	80%	81%	SE (100%) GS (83%) FW (71%)
Q9.3_3	On a scale of one to ten, how important are the following in performing your job safely? - On-the-job training	Effective	84%	84%	SE (100%) GS (82%) FW (89%)
Q9.3_9	On a scale of one to ten, how important are the following in performing your job safely? - Classroom training	Effective	75%	75%	SE (100%) GS (76%) FW (73%)
Q9.4_5	I have received training on how to do my job safely.	Agree	81%	80%	SE (100%) GS (82%) FW (79%)
Q9.4_6	The safety training I have received addressed the risks I face in my workplace.	Agree	72%	74%	SE (100%) GS (72%) FW (68%)
Q9.4_12	I understand the safety risks in my workplace.	Agree	91%	90%	SE (100%) GS (90%) FW (92%)
Q10.1_8	My workplace safety professional makes safety information and training opportunities available to me.	Agree	60%	68%	SE (80%) GS (67%) FW (37%)

[a] UNC analyzed the survey raw data to produce PNR-specific proportions for employee types.
[b] SE = Senior Executive; GS = General Schedule; FW = Federal Wage.

Team 14 Survey - Question 10.4: *"How would you improve your workplace's safety program?" (UNC analysis, n=28 of 201 comments, from 161 PNR respondents)*

The most common narrative response concern was the need for trainings to be tailored to participants' jobs and work environments. Other common recommendations were to use hands-on or instructor-led trainings, to repeat training more frequently, to improve the training tracking database, and to use Lessons Learned from incidents and near misses. Some less common suggestions were mandatory tailgate work meetings, a training schedule that allows participants enough time to process new information, and collaboration with other agencies to develop trainings.

1. Training should be specific to employee's job and work environment (n=12)
2. Quality of training and delivery (n=7)
    a. Quality of training should be higher (n=6)
    b. Training should be hands-on or instructor-led, not just reading documents (n=4)
    c. Training should be repeated more often (n=3)
    d. Training should be long enough for trainees to process information (n=1)

3. System to monitor training requirements (n=4)
    a. Training should be better tracked and kept up-to-date (n=3)
    b. Training requirements should be higher for field employees than for office employees (n=1)
4. Employees should be trained or debriefed on Lessons Learned from incidents/near misses (n=3)
5. Tailgate meetings should be mandatory (n=1)
6. Trainings should be developed in collaboration with other federal, state, and local agencies (n=1)

E) Relevant PNR initiatives

1. PNR's EEO is identifying professional competencies that can link to training opportunities (for select positions)
2. PNR's EEO is conducting 360-evaluations to identify staff who could benefit from mentoring program
3. USBR Annual FEVP Survey to assess employee satisfaction of workers (to provide managers and leadership with feedback)
4. Leadership training is in development
5. MESH or other supervisor training(s) are in development
6. Regional safety program hired an employee to develop and maintain a database that will track the required trainings and certifications for all employees, and to help develop new safety trainings

THEME #10: Work Planning and SOPs

Evidence across Data Sources (Triangulation)

UNC Summary Findings:	*Work Planning and SOPs*	
About 25% of interviews critiqued how PNR employees do large-scale work planning and job/task scheduling. Most of them want well-trained planners and safety staff to have a larger role in the planning process, but many do not have confidence in the work planning staff. Foremen and supervisors do most job/task scheduling and work assignments. Employees believe advance planning is important, but face procurement delays and shifting deadlines by management. A more centralized planning process was suggested as a remedy, although CARMA's limitations would prevent it from being the vehicle for such centralized planning. Engineers might be too inaccessible to field crews who require guidance when plans do not match the actual infrastructure. Many interviews (40%) rely on SOPs both when planning work and when conducting the work activities at worksites. To work safely, SOPs need to be written by knowledgeable staff and must reflect the unique infrastructure details. Too often the SOPs are out of date and difficult to access.		
Other Data Related to Theme		
Data Source	**Alignment w/UNC Findings**	**Relevant Findings**
UNC Benchmark Interviews (n=1 of 8)	Enhances	One organization's emergency-response planning includes both general plans with standardized work processes, and pre-planned steps for bypassing the standard process given on-site conditions.
USBR 21 Team Reports (n=4) *(#2, 4, 8, 20)*	Enhances	The planning process can incorporate safety considerations during the review of site/design plans, and during routine review of processes that affect safety (e.g., lockout/tagout, confined space). By proactively adopting a preventive design process, safety would be a default main criteria for infrastructure and process design. Agency intranets or web portals can be used to facilitate access to planning information and SOPs. The agency should forecast projections for equipment and staffing which would help inform work planning processes.
USBR Team 14 Survey *(PNR compared to USBR, n=3 questions)*	Reinforces and enhances	More PNR employees believe their workplaces consider safety when planning projects, however, fewer have been notified in advance of what to bring from home to worksite locations (which happened least among FW employees). Most employees (91%) believe agency rules/procedures will help them work safely.
USBR Team 14 Survey *(PNR narrative responses, n=5 of 201 comments)*	Enhances	Important planning for work occurs at tailgate meetings (which should be required routinely at all worksites). Plans sometimes need adjustment and field workers need cellphones to contact management for such approvals. Safety staff could help identify safer ways of implementing work plans given actual conditions. Employees might be unaware of SOPs and unable to find them.
Relevant PNR initiatives	Could help to address	• Professional consultants have helped to update SOPs in some locations

Theme Data

UNC Interviews

Almost half of the interviews discussed the process and staff involved in work planning (Table 36).

Table 36. Work Planning and SOPs (UNC Interviews, n=96)

	PNR Percent	Important Differences across PNR[a]	
		Area[b]	Position[c]
1. Who plans	49%	GC (65%)	F (73%), SS (25%), X (80%)
a. Task planning/schedule – who currently does it	29%		F (55%), X (50%)
b. Large-scale planning – who currently does it	25%		
c. Large-scale planning – who should do it	19%		F (36%)
2. Timeline for planning	31%		
a. Planned timeline gets delayed by Procurement	11%	GC (23%), RO (23%)	
b. Higher mgmt changes deadlines and priorities	10%	GC (26%)	
3. SOPs	40%	RO (15%)	C (55%), SS (17%)

[a] Blank cell means no important differences to report
[b] CC = Columbia-Cascades area, GC = Grand Coulee, SR = Snake River area, RO = PN regional office
[c] CT = craft/trade, F = foremen, M = managers, SS = safety staff, X = supervisors

About 25% of interviews identified the positions that do large-scale project and work planning, and most contrasted it with who they believe should be doing such planning. They identified that such large-scale planning is currently done by supervisors and foremen, and less by formally trained "planners," managers, or craft/trade workers. In contrast, they suggested that large-scale project and work planning should be done by trained planners (although most shared critical observations about PNR's current planners, with some described as previously injured Craft/Trade employees who needed to be assigned to desk work). Those who did not understand or trust the "planner" role, believed the work should be done by supervisors. Many want trained safety staff to provide formal input into the planning process, possibly during the design phase or at least during the final review of plans.

Smaller-scale job/task planning, assignment, and scheduling is currently done primarily by foremen and some supervisors, and there were very few suggestions to alter that process.

Employees prefer to plan work in advance, but are challenged by delays in the procurement process and shifting deadlines from management (both of which were mainly concerns at Grand Coulee, with comments by some Regional managers about the shifting timelines). Some Regional managers and safety staff suggested that a more centralized planning process is needed. They believed that such a system could enhance cross-facility communication so that the planning process gains more information about system-wide effects such as power shutdowns. Some interviews discussed the role CARMA provides in support of both planning and task scheduling, but they also discussed the limitations in the CARMA system (e.g., criteria for requiring separate work orders for a protracted or multi-component job, or for employees working across multiple jobs). Some interviews also requested more involvement from technical engineers during the planning process, including when crews consult plans in the field and realize they do not align with the existing condition of the equipment or infrastructure.

Many interviews (40%) mentioned relying on standard operating procedures (SOPs) and considered them a necessity for planning jobs and for recording safety-related changes to equipment or facility infrastructure, such as alterations to pipes and wiring layouts. More than half (55%) of Craft/Trade employees described how they use SOPs in their work. Many expressed a need for SOPs to be written by knowledgeable staff and to

reflect the unique details of specific facilities and equipment. However, many reported that SOPs are not kept up to date. They also reported difficulty in accessing, sharing, and preserving SOPs, as well as in obtaining input from engineers.

B) Benchmark Interviews (n=1 of 8)

One benchmark interview discussed work planning, and the comments were mostly related to emergency response planning. The organization plans prior to an emergency situation in order to assess location hazards, set expectations, and standardize the approach of all workers. The plan remains in effect until deviation is needed when they arrive at the scene of an emergency, and then they have a pre-planned procedure for effecting the necessary changes to standard protocol.

C) Findings from the USBR 21 Teams (n=8 items, 4 teams)

Four teams identified ways to more effectively incorporate safety considerations into the planning process, including the review of site and equipment design/plans and the review of how SOPs are implemented (e.g., lockout process, confined space access). The agency could be proactive by adopting a Prevention through Design (PtD) planning process which would facilitate designing safety into industrial infrastructure and processes.

To facilitate access to plans, policies, product specifications, and SOPs, they recommended creating an intranet or web portal for use during the planning process or when in the field.

More broadly interpreted, their planning suggestions include regional strategic planning to forecast projections for equipment and staffing, and developing guidance for the operation of Safety Committees.

1. Team 2 – Implement Safety Policy (ANSI Z10)
    a. USBR is not ensuring SOH considerations are integrated into planning decisions and daily work (pg 11).
    b. SOH personnel should conduct annual or periodic reviews of lockout, confined space, personal protective equipment, etc. which will allow for information and educational exchange during the improvement process (pg A6).
    c. Develop strategic plan to project out for equipment and staffing needs to support routine operations (pg A6).
1. Team 4 – Communications Plan
    a. Create web portal for safety-related products, best practices, and policies (pg 9).
2. Team 8 – Trust and Cooperation
    a. Create an intranet for sharing of resources (pg 12).
    b. Modify the D&S SAF 01-01 and SAF 01-06, and include guidance on safety committees in a USBR pocket guide (pp26-28).
3. Team 20 – Safety Design Process
    a. USBR needs to design facilities and equipment for safety and health by using a Prevention Through Design (PtD) process and team (pp ES2-4, 17-19).
    b. SOH and O&M staff need to be included in the review of proposed facility construction designs (pg 4).

D) How compare to Team 14 survey opinions?

Team 14 Survey – Quantitative and Likert-Scale Questions

Most PNR employees (84%) believe that their workplace considers safety during the planning of projects and work activities (Table 37), but fewer (61%) have been notified of what is needed from home for their job assignment at a worksite (i.e., part of task planning and scheduling). Fewer than half of the FW employees (44%) reported receiving such advance notice prior to joining the worksite. Almost all PNR employees (91%) believe that following the agency's safety rules/procedures is important to job safety.

Table 37. Work Planning and SOPs (Team 14 survey)

USBR Team 14 Survey Question		**Responses Included**	**PNR** (n = 721)	**USBR** (n = 3083)	**Employee Type**[a,b]
Q3.4_1	My workplace considers safety when planning activities or projects.	Agree	84%	84%	SE (100%) GS (87%) FW (74%)
Q4.3_1	I am provided advance notice of what I need to bring from home to be prepared for a worksite.	Agree	61%	62%	SE (100%) GS (67%) FW (44%)
Q9.3_4	On a scale of one to ten, how important are the following in performing your job safely? - Following safety rules and procedures	Effective	91%	91%	SE (100%) GS (90%) FW (95%)

[a] UNC analyzed the survey raw data to produce PNR-specific proportions for employee types.
[b] SE = Senior Executive; GS = General Schedule; FW = Federal Wage.

Team 14 Survey - Question 10.4: *"How would you improve your workplace's safety program?" (UNC analysis, n=5 of 201 comments, from 161 PNR respondents)*

A few narrative responses focused on work planning, including using the tailgate meetings routinely at all worksites to provide employees with the big picture (goals, plan) and work out the details (equipment condition and movement). Another person mentioned the need for workers to have cellphones in the field in order to facilitate check-ins and any changes to the work plan or schedule. A third comment requested that safety staff help support on-time accomplishment of work by assisting more frequently with developing safe work practices that address current work conditions. The two narrative responses about SOPs suggest that they are not well-known and possibly not easily accessed by employees.

Work planning (n=3)

1. Plan and facilitate mandatory "tailgate" safety meetings which includes reviewing the planned work, the reason for the job (what it will be improving), discussing safety concerns, explaining the current condition of equipment and any plans for moving it between locations.
2. Provide cellphone for staff working in isolation especially in remote field locations.
3. Safety staff need to assist with developing solutions to safety problems, and not just verify compliance or stop work.

SOPs (n=2)

1. Unaware of safety procedures (e.g., driving, winter driving, active shooter, injury).
2. Explain the regional safety program (e.g., purpose, summary of the policies and business practices that are enforced).

E) Relevant PNR initiatives

1. Professional consultants have helped update SOPs in the past

THEME #11: Job Hazard Analysis (JHA)

Evidence across Data Sources (Triangulation)

UNC Summary Findings:	*Job Hazard Analysis (JHA)*	
While helpful for promoting safety awareness and discussion, the JHA process could be streamlined to become less of a burden on PNR employees. Workers value the JHA process for new and non-routine work activities, but think the requirement should be changed/reduced for routine and non-hazardous tasks. As a process, JHAs need to be streamlined to consume less time and fewer forms. Employees who write JHAs could benefit from input by knowledgeable staff. JHA storage systems could also be improved to help employees access JHA templates and update them when needed. Essentially, for job planning and incident investigation, employees want management to emphasize the process of identifying hazards, developing potential controls/mitigations, and conducting root cause analysis, and reduce the focus on documentation by workers.		
Other Data Related to Theme		
Data Source	**Alignment w/UNC Findings**	**Relevant Findings**
UNC Benchmark Interviews (n=7 of 8)	Enhances	Most use a risk management process instead of JHA. They believe that risk management provides more in-depth analysis of complex work hazards, elicits real-time input from multiple employees, and requires high-level review by managers with the authority to approve hazard controls or mitigations.
USBR 21 Team Reports (n=3) *(#2, 9, 21)*	Reinforces and enhances	JHA process needs more involvement from safety staff. Supervisors and employees should both have input. JHAs should have a standardized format and be stored in a Region- or Area-wide electronic library. Training on JHAs needs to be tracked and improved to better convey JHA expectations. JHAs should not include minor or routine hazards such as climbing stairs. Risk evaluation can be performed using the DOI Risk Assessment Matrix (severity by frequency).
USBR Team 14 Survey *(PNR compared to USBR, n=3 questions)*	Reinforces	About ¾ of employees participate in JHA processes, but it doesn't always result in safety briefings or discussions at the worksite.
USBR Team 14 Survey *(PNR narrative responses, n=9 of 201 comments)*	Reinforces	Narrative comments focused on the need to reduce the amount of paperwork required for JHAs, allowing employees to devote more time and attention to working safely and efficiently.
Relevant PNR initiatives	Could help to address	• USBR Team 9 made suggestions to improve the JHA process

Theme Data

A) UNC Interviews

Most of the interviewees discussed the job hazard analysis (JHA) process (Table 38). Although 40% of the interviews expressed appreciation for the JHA process, 53% offered a critical perspective on the process, mainly focused on overuse, inconsistent implementation, and differences between workers and management on the value of JHAs.

Table 38. Job Hazard Analysis (JHA) (UNC Interviews, n=96)

	PNR Percent	Important Differences across PNR[a]	
		Area[b]	Position[c]
1. Appreciation for JHA	**40%**	**CC (59%)**	
a. Awareness and communication through JHA review and discussion	25%		
2. Critique of JHA	**53%**		**F (82%), M (30%)**
a. JHA overused	34%		
b. JHA inconsistently valued	29%		SS (8%)
a. JHA inconsistently implemented	28%		SS (50%)
3. Writing JHA	70%	CC (86%)	M (48%)
a. Who writes JHA	53%	CC (68%)	M (22%)
i. JHA written by worker	27%		
b. Use of pre-existing JHAs	47%		M (30%)
i. Pre-existing JHA used	34%		
4. **Reviewing JHA**	56%	CC (77%) SR (37%)	M (39%), SS (75%)
5. Suggestions for JHA change	38%		F (55%), SS (58%), X (20%)

[a] Blank cell means no important differences to report
[b] CC = Columbia-Cascades area, GC = Grand Coulee, SR = Snake River area, RO = PN regional office
[c] CT = craft/trade, F = foremen, M = managers, SS = safety staff, X = supervisors

Appreciation for JHA. The most common reason for appreciating JHA was that the hazard review and discussion promotes awareness and communication of workplace safety. Other positive comments were that JHA is useful for training new workers, invites input from multiple employees, serves as a reference document for job tasks, and documents employees' planned hazard mitigations which can provide a rationale for their actions during incident investigations.

Critique of JHA. The most common complaint about JHA, especially among craft/trade workers and foremen, was that JHAs are overused. A quarter of all interviews stated that a JHA is unnecessary for routine or non-hazardous tasks; however, employees are still required to produce a JHA for many of these tasks. JHA was also perceived as unnecessary for experienced employees already familiar with the hazards of a job. Overuse of JHA was itself seen as a safety concern, as it reduces the perceived legitimacy of the JHA process which can lead to complacency among workers who must write a JHA for each routine, non-hazardous task.

Employees perceive a difference in how JHA is valued based on employee type. Managers stated that workers did not sufficiently understand the value of JHAs, while workers and foremen saw managers as putting too much emphasis on paperwork instead of managing hazards and risk. Some employees reported feeling threatened during incident investigations, stating that investigators frequently demand to see the JHA even before inquiring into the welfare of the workers. Investigators are then observed scrutinizing the JHA for errors or omissions – which is frequently perceived as an effort by management to blame the workers. The subsequent root cause analysis usually seems to occur in a black box without continued involvement of the

workers. Safety staff and managers who explored this "disconnect" in perspective did not seem to understand the effect such an investigation style can have on worker morale and how they ultimately perceive management culture.

When discussing the implementation of JHA, many employees reported that JHAs are written without input from knowledgeable staff, and that the JHA writing process is not standardized across PNR locations. For efficiency, most employees reported using pre-existing JHAs (stressing the importance of updating them to align with conditions of the new job). However, almost one third of the workers who rely on pre-existing JHAs do not keep them updated, primarily because current computer share drive conditions make it difficult to store, locate, and edit JHAs.

Writing JHA. Workers and foremen mostly reported that they write or co-write their own JHAs, although some supervisors also reported writing them. In their opinion, writing the JHA requires too much time and paperwork. Workers' opinion is that they are required to include excessive detail in the JHAs, are not permitted to tailor generic JHAs to the unique circumstances of specific jobs and facilities, and have received conflicting descriptions of when JHAs are and are not required.

B) Benchmark Interviews (n=7 of 8)

Out of 7 benchmarking interviews, 5 reported that their organizations use a risk management process instead of JHA. Their rationale for using risk management was that it begins in real-time with an on-site discussion among the workers about potential hazards and level of risk. Some of them use the DOI Risk Assessment Matrix (frequency by severity) to classify the hazard and risk levels. Then the discussion generates potential solutions using the hierarchy of controls. The information is then documented and requires appropriate levels of management to review and authorize the hazard controls or mitigations. In contrast, they described JHA as a "pencil-whipping" task, lacking the management support needed to address safety risks, whereas the risk management process involved levels of management who have the authority to approve hazard and risk mitigations.

1. Use JHA (n=2)
2. Use risk management process instead (n=5)
    a. Process is more in-depth look at project hazards/risks (n=3)
    b. Guides risk assessment discussion in field / during job planning (n=2)
    c. Assesses hazard severity and frequency (n=2)
    d. Engages all employees involved in job (n=2)
    e. JHA does not enable employees to address safety concerns (n=1)
        i. "JHA is just pencil-whipping task with no real 'sign-off' by mgmt to permit moving forward."
    f. Risk management helps low-level employees push risks upstream farther (n=1)
    g. Risk management is better fit for complex, non-routine work (n=1)
        i. "Nature of work is complexity - no routine conditions."
    h. Solutions use technology, environmental change, PPE (n=1)

C) Findings from the USBR 21 Teams (n=28 items, 3 teams)

Most of the JHA-related findings from the 21 Teams were from Team 9, which focused specifically on JHAs. Team 9 recommendations focused primarily on JHA training, JHA format and storage, JHA review and revision, and the involvement of safety staff in the JHA process.

Although most employees identified the supervisors as responsible for reviewing and approving JHAs, they recommended that safety staff provide more input, both to help mitigate hazards, and to serve as a general source of knowledge and support for the JHA process. They suggested that safety staff and supervisors should review and revise JHAs after job completion; and, upper management need only become involved with JHAs for high-risk work or during an incident investigation.

Teams recommended that Reclamation create a standard electronic format and storage library for JHAs at the Region or Area level to allow variation while maintaining minimum standards. Training on the JHA process should be enhanced to better define JHA expectations and include hazard recognition skills, and should be tracked to ensure it is kept up to date. Other recommendations included introducing categories of "ordinary hazards" not necessary to include in JHAs, using the DOI Risk Assessment Matrix (frequency by severity) to evaluate risks, and revising RSHS Section 4 to support the recommended changes.

Of the two other teams that discussed JHAs (#2 and #21), both recommended that JHAs include input from both supervisors and employees. Team 21 also recommended applying the Hierarchy of Controls, then using a JHA to address any hazards that remain.

1. Team 2 – Implement Safety Policy (ANSI Z10) (n=1)
    a. JHA should be developed by employees closest to the job, and all affected employees and the supervisor should be offered opportunity to provide input (pg A7).
2. Team 9 – JHA Process Evaluation (n=24)
    a. Involvement from safety staff (n=6)
        i. Evaluate number, skillsets needed, and duty stations required for additional Safety Professionals needed to adequately implement and support the recommendations for improvements to the JHA process (pp 1-2).
        ii. Review and signature of Safety Specialist when newly identified high risk hazards cannot be appropriately mitigated (pp 4-5).
        iii. Review and signature of an Industrial Hygienist or SS when newly identified high risk hazards cannot be appropriately mitigated.
        iv. JHA approval at the lowest level (Supervisors) except in the case of newly identified high risk work that cannot be appropriately mitigated before the job begins (would require Safety Specialist or IH). Also require sign-off by higher level manager (pg 8).
        v. Local safety officers should track feedback on new or revised JHA forms and process and RSHS Section 4 revisions (pp 12-13).
        vi. SOH staff should be present and involved during JHA development and use so that employees and managers become more aware of key safety practices and principles (pg 14).
    b. Improve and track training on JHA (n=6)
        i. USBR should better define JHA expectations and provide improved training and guidance in their preparation, including hazard recognition skills (pg 3).
        ii. Identification of required training and confirmation of currency with employees (pp 4-5).
        iii. Identification of all required licenses, permits, clearances, critical lift plans, entry permits (pp 4-5).
        iv. Training on any revisions to the JHA process should be part of employee and supervisor trainings (pp 12-13).
        v. Develop and provide training on Job Hazard Recognition and Mitigation, and include in employee and supervisor trainings (pp 12-13).
        vi. Require every 3 years a training refresher on RSHS Section 4 and JHA (pp 12-13).
    c. Standard electronic format and storage (Region or Area level) (n=5)
        i. Implement a standard electronic format/template for Reclamation to identify the significant steps/major activity, and the corrective actions for each identified hazard (pp 1-2).
        ii. Create electronic JHA libraries that are shared locally (Area & Regional Offices) via SharePoint, Google Drive, or some other electronic filing method (pp 1-2).

iii. Reclamation wide form; forms for specific activities; or allow offices to use their own forms, if they include minimum information and is similar in style) (pp 6-7).
iv. Create electronic library of JHAs, but not USBR-wide (pp 7-8). Create them at the Regional or Area level to allow for appropriate discretion regarding creation and maintenance. Library accessible to supervisors would result in high quality JHAs with minimum investment of time. Library could include pre-job hazard checklist (Appendix C).
v. JHAs should be filed electronically. Copies of completed and signed JHAs will be maintained electronic or hard copy in the central filing system at the respective Regional/Area/Facility office (pg 9).

d. Review and revise JHAs (n=4)
i. If JHA has more the 15 Steps/activities consider separating into separate JHAs. Note that a Job Plan may have more steps than the JHA (pp 4-5).
ii. Post-job review and sign off (pp 4-5).
iii. Area Manager, FM, Regional Manager must review JHA within 14 days of near miss, injury, or damage to equipment or facility (pp 4-5).
iv. Hold a post-job review meeting within 7 days of work completion to revise the JHA and capture lessons learned which would be disseminated via Safety Committee members. Supervisor XE 2nd level review any near miss, incident or accident prior to project close out (pg 9).

e. Define ordinary hazards not included in JHA (n=1)
i. Revise RSHS Section 4 to reflect new JHA format and procedures. The standards will also define categories of ordinary hazards that do not need to be addressed in a JHA (e.g., routine walking on standard stairs, infrequent lifting of light objects of less than 20 lbs), they will also define the appropriate levels of supervisors (or employees) who will prepare the JHA (pp 1-2).

f. Revise RSHS (n=1)
i. Revise RSHS Section 4 (see Appendix A for suggested definitions and other recommendations).

g. Use Risk Assessment (n=1)
i. One option for the evaluation of risk is the DOI Risk Assessment Matrix (Appendix D) (pp 4-5).

3. Team 21 – Hierarchy of Controls (n=3)
a. Edit RSHS Section 4.1 to include employee input into the supervisor's review of the job hazards (pp 4-5).
b. Edit RSHS Section 4.2 (hazard assessments) to state that supervisor must include employee input when making decision about appropriate Hierarchy of Controls (pg 5).
c. Edit RSHS Section 4.2 (requirements for JHA) to state that JHA is used to address any hazards remaining after Hierarchy of Controls is applied (pg 6).

D) How compare to Team 14 survey opinions?

Team 14 Survey – Quantitative and Likert-Scale Questions

Almost 75% of surveyed employees in PNR reported using JHA for all jobs, which is more than Reclamation in general (Table 39). In comparison, upper management might over-estimate the use of JHA on worksites (100%). All types of PNR employees were more closely in agreement (80%) that safety briefings or JHA discussions occur at the worksite.

Table 39. Job Hazard Analysis (JHA) (Team 14 survey)

USBR Team 14 Survey Question		**Responses Included**	**PNR** (n = 721)	**USBR** (n = 3083)	**Employee Type**[a,b]
Q3.4_1	My workplace considers safety when planning activities or projects.	Agree	84%	84%	**SE (100%)** GS (87%) FW (74%)
Q4.3_4	On-site workplaces provide site-specific safety briefings or job hazard analysis.	Agree	80%	73%	SE (80%) GS (81%) FW (76%)
Q10.1_4	My workplace uses job hazard analysis on all jobs.	Agree	74%	62%	**SE (100%)** GS (73%) FW (75%)

[a] UNC analyzed the survey raw data to produce PNR-specific proportions for employee types.
[b] SE = Senior Executive; GS = General Schedule; FW = Federal Wage.

Team 14 Survey - Question 10.4: *"How would you improve your workplace's safety program?" (UNC analysis, n=15 of 201 comments, from 161 PNR respondents)*

Narrative responses uniformly cited the paperwork as excessive. They also criticized the JHA process as a documentation step that delays work and does not necessarily enhance workers' awareness of safety hazards or how to avoid them.

1. Excessive amounts of paperwork (n=9)
2. Lengthy/repeated JHA process desensitizes/distracts employees from considering hazards and working safely (n=2)
3. JHA process delays work, but does not improve safety (n=2)
4. JHA process is indication that management prioritizes documentation over safety (n=2)

E) Relevant PNR initiatives

1. None, but USBR Team 9 has recommended ways to improve the JHA process

THEME #12: Employees' Reporting of Safety Incidents and Near Misses

Evidence across Data Sources (Triangulation)

UNC Summary Findings:	*Employees' Reporting of Safety Incidents and Near Misses*
About 30% of interviewees described being actively encouraged to report safety incidents, although almost half (48%) reported being discouraged from reporting (with 35% having been discouraged by management or safety staff). The lingering effect of past management culture appears to be influencing reporting for some employees, even as awareness grows about current leadership's desire for incident reporting. Reporting can also be diminished by an employee's sense of embarrassment and/or confusion about the level of incident severity that merits reporting. Many workers and foremen perceive the reporting process as difficult, although managers and safety staff do not perceive it that way. 30% of interviewed supervisors have assisted employees to file reports. The outcome of reporting is perceived by some to bring additional disincentives, including: being investigated, receiving a low performance review, and/or losing the annual safety-related bonus. Interviews revealed inconsistencies in how local settings/facilities are handling near miss events, whether they get reported (and by whom), and whether (and how broadly) they are disseminated for instructional purposes.	

Other Data Related to Theme		
Data Source	**Alignment w/UNC Findings**	**Relevant Findings**
UNC Benchmark Interviews (n=4 of 8)	Reinforces and enhances	Management needs to actively encourage incident and near miss reporting, discourage management anger responses, and enable anonymous reporting. Frame the usefulness and benefits of reporting. Simplify the reporting process. Near miss reports provide leading indicators of unsafe conditions. Establish a reward system for near miss reporting, and guarantee no discipline.
USBR 21 Team Reports (n=3) *(#2, 8, 11)*	Reinforces and enhances	About half (56%) of Federal Employee Viewpoint Perception Survey respondents at USBR fear reprisal for reporting incidents or near misses. The agency must strive to diminish the "can-do" mentality that triggers judgement when incidents occur. The reporting process should become easier, and include a mechanism for anonymous reporting. Mgmt needs checklists to guide and support the employee during the post-incident process including investigation and any discipline if warranted.
USBR Team 14 Survey *(PNR compared to USBR, n=5 questions)*	Reinforces and enhances	Most PNR employees are aware of how to report incidents and near misses, but only half of FW (and not quite ¾ of GS) employees feel able to report without judgement from coworkers or reprisal from management.
USBR Team 14 Survey *(PNR narrative responses, n=6 of 201 comments)*	Reinforces	Employees feel discouraged from reporting when management penalizes them by reducing performance review scores or denying their safety bonus. The agency should incorporate active reporting of incidents and near misses, and assure employees that reporting will be welcomed.
Relevant PNR initiatives	Could help to address	• MESH or other supervisor training(s)

Theme Data

A) UNC Interviews

Of the many interviews that discussed the reporting of safety incidents, they mainly focused on the people and processes that influence employees' reporting behavior (Table 40).

Table 40. Incident Reporting (UNC Interviews, n=96)

	PNR Percent	Important Differences across PNR[a]	
		Area[b]	Position[c]
1. **Reporting behavior is influenced by a person**	63%	CC (82%)	M (43%)
a. Discouraged – YES	48%	CC (68%), SR (30%)	
i. Discouraged by mgmt or safety staff	35%	CC (64%), SR (13%)	F (55%)
b. Discouraged – NO	32%		X (50%)
c. Encouraged – YES	30%	CC (50%)	X (50%)
2. **Reporting behavior is influenced by the process**	48%		F (64%), M (13%), X (80%)
a. Disincentives for reporting	40%		M (9%), SS (17%)
b. Difficult reporting process	24%		F (55%)
3. **Know when to report**	31%		

[a] Blank cell means no important differences to report

[b] CC = Columbia-Cascades area, GC = Grand Coulee, SR = Snake River area, RO = PN regional office

[c] CT = craft/trade, F = foremen, M = managers, SS = safety staff, X = supervisors

Interpersonal influences. About one third (30%) of interviews reported being actively encouraged to report incidents, especially when managers or safety staff show the following types of support: i) helping them through the difficult reporting process, ii) expressing a desire to learn from the incident, or iii) inquiring about even minor injuries and sometimes suggesting reporting as a safeguard should the injury become worse over time. In contrast, almost half (48%) of all interviews reported being discouraged by someone from reporting a safety incident (with 35% receiving discouragement from management or safety staff). About one third (32%) reported not being actively discouraged by anyone. The data suggest that there is not a consistent practice in PNR for encouraging the reporting of incidents.

Internal conflict. Employees also described internal conflict about reporting incidents. About 20% of interviewees said that such internal conflict decreased their inclination to report (i.e., feeling embarrassment or shame; feeling uncertain about the level of injury warranting reporting). Some employees specifically blamed the management culture of the past, and linked employees' reluctance to report incidents to a lingering fear of retaliation (even though they might know that leadership wants them to report incidents). Others believed that management retaliation remains a current threat, and perceived some managers as seeking ways to shift the blame for incidents away from themselves, and punish workers for reporting incidents.

Process and system influences. When describing system and process obstacles to incident reporting, the most commonly mentioned was the difficulty of the reporting process, especially if Workers Comp (OWCP) is involved. This was a complaint among many workers and supervisors, and among over half of all foremen interviewed, however, it was rarely mentioned by managers or safety staff. Receiving help with the reporting process was the most commonly mentioned incentive for reporting, and 30% of supervisors described how they provide workers with assistance during reporting. The negative outcomes of reporting include having to be investigated, the potential for a low performance review, and the loss of a safety-related bonus.

Near-Miss reporting. The interviews revealed that only about 25% of Craft/Trade employees have reported or know other workers who reported near miss events. Almost 20% of foremen believed reporting of near miss

occurs, but only 10% of supervisors shared that opinion. When they described the process, some inconsistencies were identified that reveal potential confusion about: i) whether PNR requires near-miss reporting; ii) who develops the near-miss report; iii) who will use the near-miss report; iv) whether a lesson learned is required from the near miss reporting process; v) if an anonymous reporting system exists. Some interviews also revealed that some supervisors and/or superintendents handle near-miss events as a local teaching opportunity, but do not share the information with the Region for fear of the negative consequences exposure will have on morale and commitment of their workers. However, interviews also revealed that many facilities or work groups do not make instructional use of near miss events.

B) Benchmark Interviews (n=4 of 8)

Four benchmark interviews discussed incident reporting. Interviewees stressed the importance of management actively encouraging reporting by employees of both safety incidents and near misses. Encourage reporting by: i) thanking employees for reporting, ii) assuring everyone that managers will not respond to reporting with anger/discipline, iii) allowing anonymous reporting, and iv) framing an incident report as an opportunity to learn.

Frame the usefulness and benefits of reporting by: i) appealing to employees' desire to protect their coworker's opportunity to learn and improve safety; and ii) considering It as a learning opportunity for the entire organization (can help the organization discover ways to reduce injuries in a hazardous industry).

The reporting process needs to be easy for employees to use, even if it requires using hardcopy in the field. Elicit ideas for simplifying the process from employees (could be an anonymous suggestion process).

Near miss reports were seen as particularly valuable ("gifts") because they provide information without an injury having occurred and thus can serve as leading indicators of unsafe conditions. In general, improvements to the reporting process can begin with near miss reporting because there was no injury or damage, so employees might be more willing to engage with the process. Near miss reporting can also be encouraged by establishing a process for rewarding the write-up of a near miss and by guaranteeing no discipline for a near miss.

C) Findings from the USBR 21 Teams (n=8 items, 3 teams)

Findings from the 21 Teams focused on the challenges to reporting behaviors and the mechanisms of management investigation and support during and after reporting an incident or near miss event. Employees should be reinforced for reporting incidents and near misses. To ensure that employees do not fear reprisal when reporting incidents or near misses, management should clarify which specific behaviors (such as illegal activity or negligence) will be grounds for discipline. Management should acknowledge that unintentional errors are not always avoidable, and employees should not be judged for them. Provide an anonymous reporting system for minor incidents, near misses, and minor hazards. Make the reporting process more user-friendly and develop documentation to guide employees through it.

1. Team 2 – Implement Safety Policy (ANSI Z10)
    a. Federal Employee Viewpoint Survey (2014) showed that 56% of USBR respondents do not feel safe from reprisals if they report an illegal activity (pg 13).
2. Team 8 – Trust and Cooperation
    a. Incident investigation teams should discuss and acknowledge that humans cannot always be error-free, and that employees should be reinforced for reporting the incident (pg 23).
    b. Develop a checklist to guide employees and managers through the post-incident process. Ensure a clear separation between disciplinary actions and other processes. Include clear listing of negative consequences for specific behaviors such as negligence (pg 23).
    c. Document accident follow-up processes (pg 23).

   d. Document incident follow-up processes and guidance given to staff (pg 23).
3. Team 11 – Information Sharing Plan
   a. Provide for anonymous reporting of minor safety hazards and incidences (electronic and paper versions).
   b. Need user-friendly, electronic or manual reporting system for safety issues (pg 2).
   c. Change norm of USBR's "can do" mentality that triggers sense of judgement for incident or near-miss (pg 2).

D) How compare to Team 14 survey opinions?

Team 14 Survey – Quantitative and Likert-Scale Questions

Most PNR respondents (84%) answered that they knew how to report incidents and near miss events, even though only 20% have witnessed such an event (Table 41). Compared to GS employees, FW employees were slightly more likely to know how to report injuries, near misses, and safety violations, but responded more negatively to every other question about reporting. All senior executives had positive perceptions of the conditions for reporting, but not all were personally familiar with the reporting process.

Many employees (82%) felt encouraged to report, however, fewer could report without fearing coworker judgement or manager reprisal. For example, only half of FW employees, and less than three quarters of GS employees, felt safe from reprisal or judgement. Both groups were more likely to fear judgement from coworkers than reprisal from management.

Table 41. Incident Reporting (Team 14 survey)

USBR Team 14 Survey Question		**Responses Included**	**PNR** (n = 721)	**USBR** (n = 3083)	**Employee Type**[a,b]
Q3.4_3	I am encouraged to report injuries, near misses, unsafe behavior and safety violations in my workplace.	Agree	82%	82%	SE (100%) GS (86%) FW (75%)
Q3.6	People in my workplace can report accidents or near misses without fear of reprisal from managers, supervisors or coworkers.	Agree	70%	76%	SE (100%) GS (74%) FW (58%)
Q7.2_9	My coworkers would not judge me negatively for reporting a safety violation.	Agree	64%	68%	SE (100%) GS (68%) FW (50%)
Q9.4_17	I know how to report injuries, near misses, and safety violations.	Agree	84%	83%	SE (80%) GS (83%) FW (87%)
Q11.1	Have you witnessed an injury, near miss or other safety violation in your workplace in the past six months?	Yes	20%	16%	SE (0%) GS (16%) FW (35%)

[a] UNC analyzed the survey raw data to produce PNR-specific proportions for employee types.
[b] SE = Senior Executive; GS = General Schedule; FW = Federal Wage.

Team 14 Survey - Question 10.4: *"How would you improve your workplace's safety program?" (UNC analysis, n=6 of 201 comments, from 161 PNR respondents)*

Narrative responses expressed concerns that employees are penalized for reporting, mostly through reductions to year-end bonuses or performance evaluation scores. Employees need assurance that reporting is welcomed and has no stigma attached.

1. Employees are penalized for reported incidents/near misses (n=4), including:
    a. Decreased performance review score (n=3)
    b. Loss of safety bonus (n=1)
2. Incorporate active reporting of near-misses, advisories and alerts (n=1)
3. Assure employees that incident reporting is welcomed and has no stigma attached (n=1)

E) Relevant PNR initiatives

1. MESH or other supervisor training(s) might include a module about how to support employees' reporting of incidents and near misses.

THEME #13: Incident Investigations

Evidence across Data Sources (Triangulation)

UNC Summary Findings:	*Incident Investigations*	
Interviews suggested that investigation teams might not obtain complete information unless they directly and consistently communicate with the employees involved in the incident. In general, more input could be sought from safety staff, supervisors, and additional Craft/Trade workers. Investigations would benefit from the use of root cause analysis, and it might help shift the perception in PNR that investigations are designed to place blame on employees. Investigators might need additional training to effectively use root cause analysis methods.		
Other Data Related to Theme		
Data Source	**Alignment w/UNC Findings**	**Relevant Findings**
UNC Benchmark Interviews (n=1 of 8)	Reinforces and enhances	Facilitated Learning Analysis (FLA) is an investigative method that also guides employees through a learning experience based on an incident. FLA constructs the "story" of an incident by assuming the employee's good intentions, and tries to discover the underlying context and reasoning for the employee's decisions. The goal is to improve future decision-making among workers.
USBR 21 Team Reports (n=3) *(#2, 8, 9)*	Reinforces and enhances	Supervisors currently conduct many investigations, but they need training in investigation methods. Investigations could benefit from more safety staff input. Employees need more explanation to understand the investigation process, its potentially positive impact, and conditions when discipline will be emphasized (e.g., illegality, destructive intent, and negligence). The investigative role of higher management needs clarification to help improve the systems that influenced (or could have intervened in) the incident.
USBR Team 14 Survey *(PNR compared to USBR, n=no questions)*	N/A	N/A
USBR Team 14 Survey *(PNR narrative responses, n=4 of 201 comments)*	Enhances	Safety committees might not be qualified to identify incidents meriting formal investigation. One response wants to enforce compliance by employees. Others seek to minimize the blaming of employees, and focus more on solutions to hazardous conditions.
Relevant PNR initiatives	Could help to address	• MESH or other supervisor training(s)

Theme Data

A) UNC Interviews

More than one third (40%) of interviews commented on incident investigations, and most focused on the process, with some interviews discussing team makeup and report distribution (Table 42).

Table 42. Investigations (UNC Interviews, n=96)

	PNR Percent	Important Differences across PNR[a]	
		Area[b]	Position[c]
Investigations	**40%**		**SS (58%)**
1. Concerns about investigation process	26%		SS (50%)

[a] Blank cell means no important differences to report
[b] CC = Columbia-Cascades area, GC = Grand Coulee, SR = Snake River area, RO = PN regional office
[c] CT = craft/trade, F = foremen, M = managers, SS = safety staff, X = supervisors

Investigation process. When discussing the investigation process, interviews questioned the completeness of the information that investigations gather. Interviews suggested that if investigation teams communicated more directly and consistently with employees involved in incidents, the quality and usefulness of their assessment would be enhanced. In general, they suggested that investigations receive input from a wider range of perspectives, especially Area safety staff, supervisors, and workers familiar with the task activities. They also suggested that investigators should use root cause analysis (and/or cultural analysis) methods instead of focusing predominantly on the behavioral events of an incident (which can lead to the perception that management seeks to blame workers during investigations). By adjusting the emphasis, investigations could become perceived as part of PNR's intention to communicate broader safety lessons and enhance learning appropriate for employees in multiple work contexts. Some interviews suggested that additional training might be needed to help investigators become proficient in root cause analysis. In addition, some employees suggested that incident trends might be tracked and analyzed, but do not necessarily inform the investigation process or findings.

B) Benchmark Interviews (n=1 of 8)

One benchmark interview discussed incident investigation. The organization replaced its previous investigation process (which was perceived by employees as presuming the worker was "at fault") with a Facilitated Learning Analysis (FLA). FLA emphasizes a facilitated process for workers to "build the story" of the incident by assuming the employee had good intentions. Participants then explore the potential context and reasoning behind the employee's decisions under the stressors they were experiencing (i.e., they put themselves into the shoes of the employees involved in the incident). Participants then identify ways to systematically improve decision-making in future situations.

C) Findings from the USBR 21 Teams (n=10 items, 3 teams)

Three teams examined the incident investigation process (Teams # 2, 8, and 9). Their advice suggested to:

Enhance input from supervisors and safety staff. Supervisors routinely perform incident investigations, but they need training in investigation methods and techniques. In addition, the investigation process could benefit from having trained safety staff provide more input to the incident analysis and more assistance in developing countermeasures for future prevention.

Help employees appreciate investigation. More explanation is needed for employees to understand the incident investigation process and how follow-up will impact their workplace and job. Investigations should specifically clarify the conditions for discipline (i.e., illegality, destructive intent, or negligence). Management needs to highlight the positive impact from incident reporting, and positively acknowledge or reward employees for reporting.

Clarify the Investigation review process and how to adjust JHAs. Roles need to be clarified for how higher levels of management should review and provide input to the investigation process, including the review of work documentation that guided employee activities (i.e., JHA). Input from management and the safety committee(s) could help improve procedures in the future (e.g., the JHA documentation and/or review process, the documentation and sharing of lessons learned, the final review of completed jobs).

1. Team 2 – Implement Safety Policy (ANSI Z10) (n=3)
    a. Safety staff do not routinely investigate an incident. The supervisor is responsible for the investigation (pg A4).
    b. Supervisors need to be trained in incident investigation techniques so they avoid "pro forma" investigations (pg A4).
    c. SOH personnel are not adequately analyzing injury and illness reports/data to ensure countermeasures are developed (pg 11).
2. Team 8 – Trust and Cooperation (n=3)
    a. Document accident/incident follow-up processes and guidance given to staff (pg 23).
    b. Develop a checklist to guide employees and managers through the post-incident process. Ensure a clear separation between disciplinary actions and other processes. Include clear listing of negative consequences for specific behaviors such as negligence (pg 23).
    c. Incident investigation teams should discuss and acknowledge that humans cannot always be error-free, and that employees should be reinforced for reporting the incident (pg 23).
3. Team 9 – JHA Process Evaluation (n=3)
    a. Area Manager, FM, Regional Manager must review JHA within 14 days of near miss, injury, or damage to equipment or facility (pp 4-5).
    b. Hold a post-job review meeting within 7 days of work completion to revise the JHA and capture lessons learned which would be disseminated via Safety Committee members. Supervisor XE 2nd level review any near miss, incident or accident prior to project close out (pg 9).
    c. Local safety committees will discuss near-misses, incidents, and accidents and disseminate related information as appropriate (pg 13).

D) How compare to Team 14 survey opinions?

Team 14 Survey – Quantitative and Likert-Scale Questions

The Team 14 survey had no questions that directly addressed incident investigations.

Team 14 Survey - Question 10.4: "How would you improve your workplace's safety program?" (UNC analysis, n=4 of 201 comments, from 161 PNR respondents)

Four narrative responses were related to investigations. One questioned the qualifications of safety committees to identify the incidents that merit formal investigation. Three addressed the emphasis of investigations (with two seeking broader system emphasis, and one comment seeking a behavioral/compliance emphasis).

Qualifications of investigators (n=1)

1. Safety committee lacks knowledge to determine which safety issues are worth investigation and which are due to unavoidable hazards.

Emphasis of the investigation (n=3)

1. Investigations should focus on enforcing employee compliance with existing procedures, not on changing procedures *(NOTE: this person has a supervisory role)*.
2. Managers should focus less on documentation (e.g. time loss records, JHAs) after injuries, and more on supporting recovery and preserving anonymity of injured employees.
3. Employees perceive management as assigning blame to employees who report incidents, rather than looking for solutions to safety problems.

E) Relevant PNR initiatives

1. MESH or other supervisor training(s) are in development

THEME #14: Dissemination of Incidents, Near Misses, Lessons Learned

Evidence across Data Sources (Triangulation)

UNC Summary Findings:	*Dissemination of Incidents, Near Misses, Lessons Learned*	
Workers believe that safety incidents and near miss events can provide valuable information and lessons learned for improving safety, but they need to be more consistently communicated to all employees in PNR. An initial, rapid announcement could highlight case facts to provide a cautionary alert. A follow-up report could provide a status update and additional details as they become available. A final update could provide suggestions and recommendations for improving similar situations throughout PNR. All disseminated information and reports should avoid embarrassing or assigning blame to employees involved in the case events, and management needs to provide initial and follow-up support to those employees to preserve their commitment and motivation for future reporting.		
Other Data Related to Theme		
Data Source	**Alignment w/UNC Findings**	**Relevant Findings**
UNC Benchmark Interviews (n=3 of 8)	Reinforces and enhances	Reported information from incidents and near miss events is useful for helping save coworker lives in future – and this can be the promotional hook to encourage reporting behavior. Near misses are advance warnings (leading indicators) that suggest how to improve safety culture to avoid future incidents.
USBR 21 Team Reports (n=5) *(#2, 4, 9, 11, 13)*	Reinforces and enhances	Initial case alerts should be distributed within 48-hours of the event, with follow-up reporting of additional details and case fact corrections. Work teams can use a "safety lead" liaison to management to follow-up on near miss safety concerns. Near miss information should be distributed through newsletters, safety committees, and other mechanisms. The information and trend data can help management identify safety hazards that need improvement.
USBR Team 14 Survey *(PNR compared to USBR, n=2 questions)*	Reinforces and enhances	Many employees believe information about incidents and near misses could be useful for identifying hazards and potential improvements. But half of FW employees are not aware of any corrective actions taken after such an event. If information is distributed, it is not routinely penetrating to the lowest levels of the organization.
USBR Team 14 Survey *(PNR narrative responses, n=10 of 201 comments)*	Reinforces	PNR needs to effectively distribute the facts and lessons learned from incidents and near misses, and focus less on assigning blame or punishment. In order to prevent future incidents, employees need to be informed of each case and subsequent corrective actions.
Relevant PNR initiatives	Could help to address	• MESH or other supervisor training(s) • PNR *Safety Spillway* • PNR *Yellow Alerts*

Theme Data

A) UNC Interviews

Employees were in agreement that information about safety incidents, near misses, and the lessons learned from investigation or employee reflection, are helpful for improving safety, but that such information is not consistently reaching all locations and levels of PNR (Table 43).

Table 43. Distribution of incident, near miss, and lessons learned information (UNC Interviews, n=96)

	PNR Percent	Important Differences across PNR[a]	
		Area[b]	Position[c]
1. Distribution of incident/NM/LL info			
a. Information is distributed	33%	CC (55%), GC (19%), RO (46%)	F (18%), X (50%)
b. Information is not distributed	21%	GC (32%)	
2. Enhance information accuracy and detail	31%		X (50%)
3. Consider employee reputation	26%	CC (50%)	

[a] Blank cell means no important differences to report

[b] CC = Columbia-Cascades area, GC = Grand Coulee, SR = Snake River area, RO = PN regional office

[c] CT = craft/trade, F = foremen, M = managers, SS = safety staff, X = supervisors

Incomplete awareness of incident/NM/LL information. Although safety incidents and near misses might be discussed in some committees or work meetings, or distributed electronically, the information is not consistently reaching all PNR employees. Approximately half of employees in the Columbia-Cascades Area and the Regional Office were aware of the distributed information, while only 19% at Grand Coulee shared that awareness. More supervisors (50%), managers (43%), and safety staff (42%) reported being aware of the information, compared to Craft/Trade workers (29%) and foremen (18%). This suggests that the information is not adequately penetrating to the lowest levels of the organization.

Enhance information accuracy and detail. Most comments about incident and near miss information suggest that it can be helpful for improving safety, however, the information is not always perceived as accurate or sufficiently detailed. The timeframe for conducting incident investigations, or for near miss reflection and analysis, was suggested as one reason for the lack of detailed information (i.e., pressure to release an initial report before a thorough investigation has been completed). Interviewees recommended that regardless of the quality of an initial announcement about an incident or near miss, there must be follow-up with a detailed incident report to ensure PNR facilities and employees are adequately informed of the safety hazards, risks, and potential for control/mitigation. As the employees performing potentially hazardous tasks, the Craft/Trade workers and foremen specifically want to receive this type of information in a timely manner, with additional details as they are learned.

Consider employee reputation. 26% of employees believed that the dissemination of incident and near miss information should be handled carefully to avoid embarrassing or assigning blame to the employee. Several Craft/Trade workers shared stories about the swift and negative impact on their reputation when information about an incident is released. One story portrayed an imbalance of power and influence between management and employees, with the employee feeling pressure to consent to the incident being shared across the region. Although anonymity was technically provided, employees throughout the Area deduced who the incident involved. This caused embarrassment and stress to the employee. The employee reported that no management or regional staff contacted the employee to check-in for collateral damage after publication. The negative impact impelled the employee's decision to avoid reporting in future, and some coworkers who observed the negative impact mentioned that they also decided to avoid reporting.

Contrary to this view, a few interviews suggested that such employees should be singled out, especially if they purposefully did something unsafe.

Interviewees also described a new practice within PNR of having employees involved in a near miss make a presentation about it to a safety meeting or safety committee. There was not uniform agreement on the outcome of this practice: the discussion could be useful, but the potential negative impact on employee reputation was a disincentive.

B) Benchmark Interviews (n=3 of 8)

Three benchmark interviews discussed the dissemination of incident and near miss information. By describing the purpose for disseminating such information (i.e., to help their fellow workers avoid similar hazardous situations), they believe employees are more encouraged to report incidents and near misses. They also guarantee that no blame or discipline will follow the reporting of a near miss event. One organization even gives an award to employees who report their near miss events.

Employees involved in a near miss write up the information for use by the organization in presentations and trainings. Anonymity of the employees is provided when appropriate and requested. During presentations at safety meetings, the supervisor leads a discussion with workers about the event. During safety trainings, the near miss is shown in slides that include photographs and a timeline of events. Training participants identify potential changes that could be made to improve the conditions.

One benchmark interview described how the sharing of near misses by the workers involved helps to "humanize" the workers and further erode the "warrior culture" that has been a longstanding organizational norm.
In addition, the near miss information is valuable as data for trend analysis of leading indicators of safety. In essence, the analyzed near miss provides advance warning to the organization about hazardous conditions or elevated risk levels, and the organization can take steps to assess and improve the conditions.

C) Findings from the USBR 21 Teams (n=13 items, 5 teams)

Information about near misses should be distributed through safety committees, newsletters, and other communication mechanisms as defined in the organization's reporting requirements. Reports of both incidents and near misses should be reviewed by supervisors, management teams, and safety committees; analyzed to identify trends and develop countermeasures; and distributed throughout the agency. The timeline for disseminating information should align with the seriousness of the event (e.g., major events should receive 48-hour publication of case facts, with a later follow-up of details and recommendations).

One goal when disseminating the information is to ensure employee awareness and caution. Another goal is to facilitate investigation, analysis, and discussion by appropriate entities who consider trends, and environmental conditions. Data sources should be reviewed to ensure they adequately document the necessary information, and provide support for trend analysis. (Sources of near miss data include the DOI Inspection Abatement System, and the near-miss module from SMIS.) The case data and information help inform the identification of hazards and potential remedial action, possibly in a continuous improvement cycle. Work teams can assign a "safety lead" to communicate between workers and safety staff and ensure that safety concerns such as near misses are resolved.

Related components of the safety management system (e.g., JHA document and process) should also be reviewed in light of the reported information from the incident or near miss.

1. **Disseminate information about incidents, near misses, and lessons learned (n=4 items, 2 teams)**
    a. Team 9 – JHA Process Evaluation
        i. Local safety committees will discuss near-misses, incidents, and accidents and disseminate related information as appropriate (pg 13).
    b. Team 11 – Information Sharing Plan
        i. Describe the submitted topics in newsletters for discussion in safety meetings (pg iii).
        ii. For major incidents (e.g., intensive care, loss of limb, fatality), USBR expedite agency-wide within 48 hours a report of the incident facts (pg iii).
        iii. Incident and near miss reporting requirements need to describe the process for disseminating SOH information outside of management (pg 3).

2. **Use near miss data to identify needed process changes and potential trends (n=9 items, 5 teams)**
    a. Team 2 – Implement Safety Policy (ANSI Z10)
        i. SOH personnel are not adequately analyzing injury and illness reports/data to ensure countermeasures are developed (pg 11).
        ii. Review incident and near miss reports with the Facility, Area Office, or Regional management team, to discuss incident trends and communicate observations (pg A6).
        iii. Assign rotational "safety lead" for first-line supervisors or workers to help ensure team safety considerations are addressed including discussions with workers or supervisors observed unsafe behaviors, unaddressed hazards, procedural discrepancies, and/or close calls. Have the safety leads meet with SOH representatives to discuss and resolve issues (pg A7).
    b. Team 4 – Communications Plan
        i. Use near-miss data in a continuous improvement process to identify potential serious accident conditions (pp 4-7).
    c. Team 9 – JHA Process Evaluation
        i. Area Manager, FM, Regional Manager must review JHA within 14 days of near miss, injury, or damage to equipment or facility (pp 4-5).
        ii. Hold a post-job review meeting within 7 days of work completion to revise the JHA and capture lessons learned which would be disseminated via Safety Committee members. Supervisor XE 2nd level review any near miss, incident or accident prior to project close out (pg 9).
        iii. Local safety committees will discuss near-misses, incidents, and accidents and disseminate related information as appropriate (pg 13).
    d. Team 11 – Information Sharing Plan
        i. Near misses are important indicators to track. DOI Inspection Abatement System could be used (pg 14).
    e. Team 13 – Leading Metrics
        i. 3-phase approach: a) Revise the USBR Dashboard and implement the near-miss module of SMIS; b) Examine baseline near-miss data from SMIS and develop appropriate leading metrics; 3) annually review and assess the effectiveness of leading metrics (pg 1).

D) How compare to Team 14 survey opinions?

Team 14 Survey – Quantitative and Likert-Scale Questions

Employees expressed a desire to prevent similar incidents and near misses in their own worksites. However, less than two thirds of respondents said that their workplace developed corrective action plans after near misses or incidents (Table 44). Only half of FW employees observed similar action planning in their workplace; and FW employees were less likely to consider their managers as responsive to near misses and safety issues.

To make corrective action plans, employees would need to receive the details, causes, and corrective actions taken for an incident or near miss event. But that information does not seem to be routinely and systematically reaching all employees through official communication processes.

The final communication arising from an incident or near miss event, might be the lessons learned. When asked about the dissemination of best practices and lessons learned across PNR, only half of GS employees, and only one quarter of FW employees, observed the information being shared. Even senior executives (SE) did not consistently report sharing of lessons learned, suggesting that dissemination could be improved at all levels and specifically among FW employees.

Table 44. Near Miss and Lessons Learned (Team 14 survey)

USBR Team 14 Survey Question		**Responses Included**	**PNR** (n = 721)	**USBR** (n = 3083)	**Employee Type**[a,b]
Q10.1_2	My workplace develops corrective action plans after injuries, near misses or other incidents.	Agree	61%	61%	SE (80%) GS (65%) FW (51%)
Q10.1_3	Best practices and lessons learned are shared across offices in my Region.	Agree	48%	52%	SE (60%) GS (55%) FW (26%)

[a] UNC analyzed the survey raw data to produce PNR-specific proportions for employee types.
[b] SE = Senior Executive; GS = General Schedule; FW = Federal Wage.

Team 14 Survey - Question 10.4: *"How would you improve your workplace's safety program?" (UNC analysis, n=10 of 201 comments, from 161 PNR respondents)*

Narrative comments were generally dissatisfied with the distribution of incident and near miss information, and suggested a sequence of communications. Such information could then be discussed at safety meetings.

Disseminating incident and near miss information

1. Distribute throughout PNR a summary of the key facts and lessons learned shortly after an incident or near miss occurs (n=8)
2. Encourage open discussion of incident or near miss circumstances and lessons at safety meetings and committees (n=1)
3. Post incident and near miss information on "Safety Board" in each facility (n=1)

E) Relevant PNR initiatives

1. MESH or other supervisor training(s) might include guidance for how to discuss in safety meetings the PNR-distributed reports on incidents and near misses (and their lessons learned)
2. PNR *Safety Spillway*
3. PNR *Yellow Alerts*

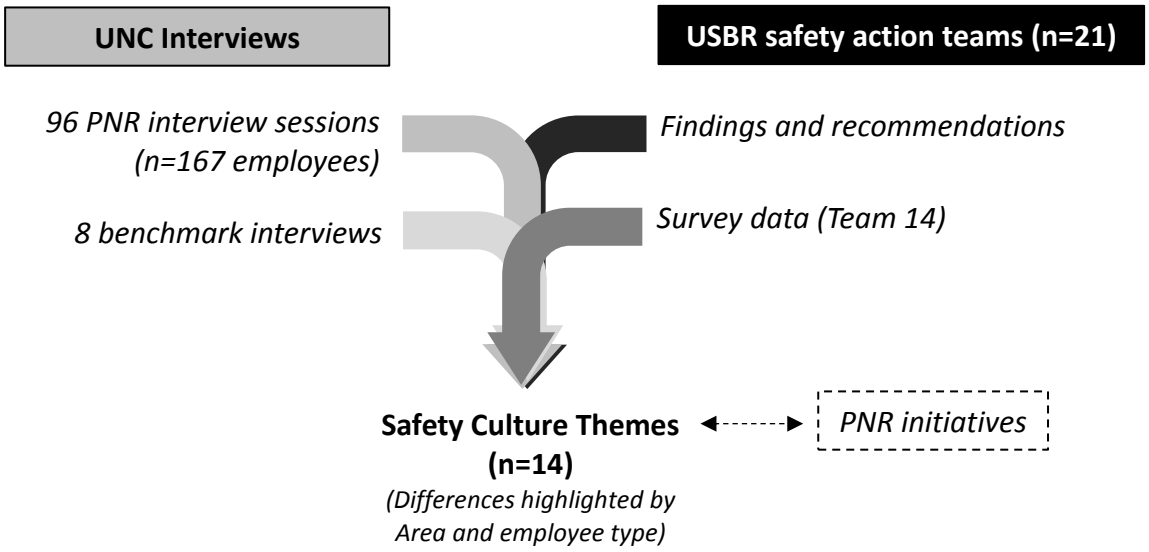
Section 4. Discussion

The U. S. Bureau of Reclamation's Pacific Northwest Region (PNR) experienced a general decline in workplace injuries from 2002 through 2014. During that time period, an average of 128 injuries occurred each year, with half being recordable injuries. Prior to PNR's restructuring and employee reduction in 2010, the recordable injuries ranged from 56 to 92 per year. After 2010, the injuries ranged from 31 to 59 per year. The general decline in recordable injuries ended in 2012, and the next year began an increase in injuries (including two notably severe injuries in 2013).

This analysis focused mainly on the 2010-2014 time period. During those years, the distribution of injuries across the workforce varied by Area, with the Columbia-Cascades Area experiencing a disproportionate share of injuries within the six most hazardous Craft/Trade occupations, and the Snake River Area experiencing a disproportionate share of injuries within the four most hazardous non-Craft/Trade occupations.

UNC identified 14 themes that are critical to enhancing PNR's safety culture. These themes were identified through data collection and analysis of candid observations provided by 167 PNR employees during 96 interview sessions. UNC also conducted benchmarking interviews with 8 external organizations. The UNC team then triangulated the 14 safety culture themes with findings and recommendations from the 21 USBR Safety Action Team reports and with suggestions from the benchmark interviews. UNC's triangulation process identified significant overlap across the multiple sources of information (Figure 10), which suggests a uniformity to the guidance provided by this report.

Figure 10. Result When Triangulating Data Sources to Develop the Safety Culture Themes



PNR should take action in each of the 14 themes to positively improve their safety culture. For each theme improvements can be planned based on the specific findings detailed in the Results section of this report. Current PNR initiatives will contribute to such improvements (Figure 10), although the region should identify the gaps between the impact of the PNR initiatives and the concerns listed in this report. The 14 themes are categorized below as they correspond to PNR organizational structure with general descriptions and examples of improvement opportunities.

A. Administrative culture *(2 themes)*
To improve the region's safety culture, PNR will need to address some of the administrative barriers that seem to diminish the ability of Craft/Trade workers to efficiently and effectively do their jobs. This includes ensuring the hiring process can successfully recruit the most skilled applicants, and that a procurement system can handle the seasonal variation in purchase requests while providing valuable customer service that facilitates large purchase requests.

B. Management/Employee culture *(4 themes)*
To improve the region's safety culture, PNR will need to improve communication dynamics between management and employees which seem to currently cause confusion and distrust regarding roles, responsibilities, and the value of the worker to PNR. Managers will need to become aware of how their decisions can have broad and possibly unexpected impact on safety in the workplace. Communication systems will need to ensure messages penetrate from top to bottom. Communication could also promote the safety culture with stories and images of safe work team dynamics.

C. Components of the Safety Management System (SMS) *(8 themes)*
To improve the region's safety culture, PNR will need to enhance select components of the safety management system. Safety staff need additional training in order to become a source of proactive support to workers. Safety Committees need to clarify their purpose and meeting process to ensure they can translate issue discussion into formal recommendations and action. All trainings need instructors who are knowledgeable and technically competent, and skillful at using adult-learning methods. PNR should incentivize the reporting of incidents and near misses, and enhance their procedure to develop communications from those reports by protecting worker identities, and creating a standard process for providing follow-up information across the region.

With new leadership at the Regional (2012) and Area (2014, 2015) levels, PNR is well-positioned to plan for improvements to its safety culture. Although a behavior-based approach to improving safety is necessary, it is not sufficient to effect sustained improvements, and because it targets individual employees, it lacks the scale of efficiency which a systems approach can attain (Table 45).

Table 45. Summary Comparison of Behavior-Based and Culture-Change Approaches to Safety Management

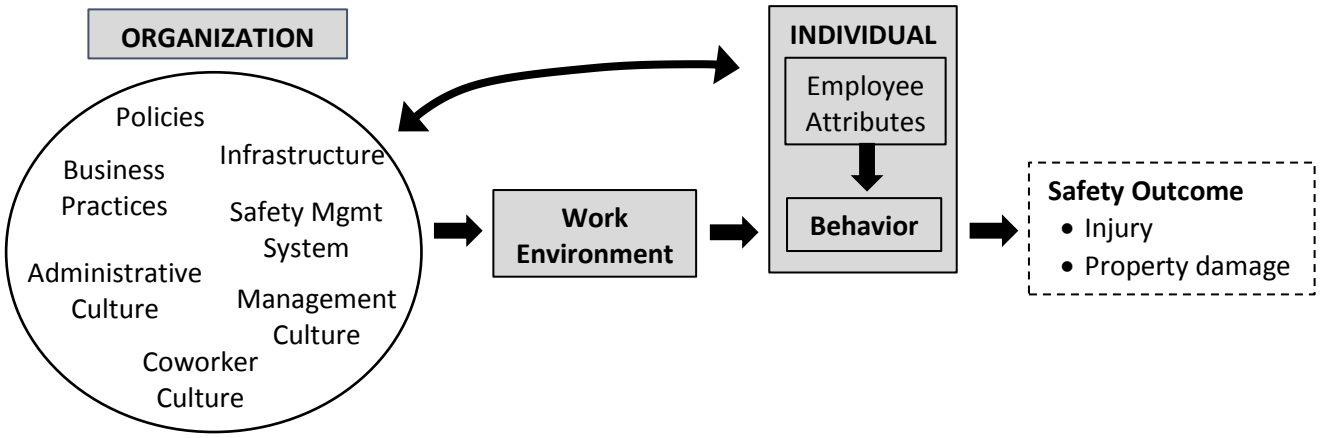
Characteristic	Behavior-Based Approach	Culture-Change Approach
Background/Origin	• Operant psychology • Behavior modification	• Organizational behavior • Anthropology
Key aspects	• "Bottom-up" approach • Analytic and data-driven • Setting specific • Continuous process	• "Top-down" approach • Intuitive and anthropological • Setting specific • Self-sustaining
Typical implementation	• Identify and define critical behaviors • Set performance goals • Observe/sample behavior • Provide contingent reinforcement	• Assess the culture • Devise alternative vision • Work with leadership and employees to implement change
Principal strengths	• Specific technology • Objective and empirical • Shop floor focus • Participatory (usually) • Positive	• Emphasizes organizational change • Focuses on basic causes • Participatory (often) • Comprehensive

Characteristic	Behavior-Based Approach	Culture-Change Approach
Principal weaknesses	• Victim-blaming • Minimizes the environment • Focuses on immediate causes	• Diffuse technology • Subjective and intuitive • Indirect

Source: DeJoy (2005)

PNR should develop a multi-level approach toward intervention and improvement as they use the findings from this safety culture assessment. When behavior-based safety change is applied, it should be targeting all employees (including managers), and it should be combined with culture-change to produce a more systemic and sustainable impact (DeJoy, 2005; Khanzode et al, 2012; VanDijk et al, 2010). A multi-level approach is a systems-approach (ANSI Z10, 2012) that develops change strategies for the organization, work environments, and individual employees (Figure 11).

Figure 11. Multi-Level Approach to Changing Organizational Safety Culture



To create culture change, PNR should use a participatory process to plan how best to integrate UNC's assessment findings and develop regional improvements, some of which could be tailored to Area/Facility sub-cultures. Such a participatory process could:

1. Engage with employees at multiple levels of the organization, possibly through existing Safety Committees and additional working groups
2. Review the assessment findings in the 14 themes to:
    a. Identify differences in the findings and plan for adaptation as needed across:
        i. Areas (CCAO, GCPO, SRAO, PNRO)
        ii. Employee type (Craft/Trade, Foreman, Supervisor, Safety Staff, Middle-Management, Leadership)
    b. Identify how the concerns might be partially addressed by:
        i. Implementation planning by the USBR 21 safety action teams
        ii. PNR's current initiatives
3. Plan how to implement recommendations from all data sources, and identify additional ideas for improving the identified concerns
4. Create timeframes for planning, piloting, and future monitoring

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Appendices to the Final Report

Safety Culture Assessment

U. S. Bureau of Reclamation - Pacific Northwest Region (PNR)

July 28, 2017

Appendix A. Secondary Data Sources Reviewed During Year 1 (2015-16) Sorted by Data Type

Description	Data Type	Source
1. PNR Concept to Implementation business model framework (2017)	Communications	PNR
2. PNR memorandum from Commissioner to employees to remind about safety practice (n=1, 2016)	Communications	PNR
3. PNR Safety Alerts (hazard, incident, near miss, lessons) (2014-16)	Communications	PNR
4. PNR Safety Committee meeting notes (2012 – 2016)[a]	Communications	PNR
5. PNR Spillway (2016-2017)	Communications	PNR
6. Reclamation memorandums to employees (n=6, 2014-2017)	Communications	USBR
7. Reclamation press releases – upgrade plans for PNR facilities	Communications	USBR
8. Reclamation Safety Alerts (incident, lessons) (2014-16)	Communications	USBR
9. Reclamation Safety and Occupation Health (prior to 2015)	Communications	USBR
10. Reclamation Safety Factor (2014-2016)	Communications	USBR
11. PNR Employee Roster (2002-2015)	Datasets	PNR
12. TOPF Safety, Health and Environmental Culture Assessment	Datasets	TOPF
13. DOI Safety Management Information System (SMIS, 2000-2015)	Datasets – *de-identified*	USDOI
14. 29 CFR § 1904.35 – anti-retaliation for reporting injury	Guides & Standards	USDOL
15. ANSI /ASSE Z690.1-2-3 (2009, 2011)	Guides & Standards	ANSI/ASSE
16. ANSI Z10 (2005)	Guides & Standards	ANSI/AIHA
17. ANSI Z10 (2012)	Guides & Standards	ANSI/AIHA
18. DOI Department Manual (2015)	Guides & Standards	USDOI
19. DOI Handbook for Field Operations (2014)	Guides & Standards	USDOI
20. DOI Occupational Medicine Handbook (2009)	Guides & Standards	USDOI
21. DOI Safety and Health Training Requirements and Position Competencies (2014)	Guides & Standards	USDOI
22. DOI SOH Program Evaluation Tool (2010)	Guides & Standards	USDOI
23. ISO 31000/31010	Guides & Standards	IEC/FDIS
24. OPM Form SF178 – medical exam	Guides & Standards	USOPM
25. OPM Veterans Employment Initiative Vet Guide	Guides & Standards	USOPM
26. OSHA Fact Sheet: Injury and Illness Prevention Programs	Guides & Standards	OSHA
27. OSHA Fact Sheet: Voluntary Safety and Health Program Management Guidelines	Guides & Standards	OSHA
28. OSHA Field Safety and Health Manual (2011)	Guides & Standards	OSHA
29. OSHA Form 300(A) – for reporting injuries/illnesses	Guides & Standards	OSHA
30. OSHA Memo 10/19/16 re: 1904.35	Guides & Standards	OSHA
31. OSHA Program Evaluation Profile (1995)	Guides & Standards	OSHA
32. OSHA Safety and Health Management Systems eTool	Guides & Standards	OSHA
33. PNR Competencies for Leadership draft	Guides & Standards	PNR
34. PNR Competency Taxonomy version 3 draft (2015)	Guides & Standards	PNR
35. PNR Job Hazard Assessment (JHA) - completed forms	Guides & Standards	PNR
36. Reclamation FIST 6-1 – management of power facilities	Guides & Standards	USBR
37. Reclamation Manual: Directives and Standards	Guides & Standards	USBR
38. Reclamation SOH Policies and Standards	Guides & Standards	USBR
39. Reclamation Writers Style Guide for Standing Operating Procedures	Guides & Standards	USBR
40. DOI Safety and Health Strategic Plan (accessed 2016)	Plans	USDOI
41. PNR ESA Emergency Protocol Plan – samples from SRAO	Plans	PNR
42. Reclamation SOH Action Plan (2014)	Plans	USBR
43. BPA O&M expenses review for ACE and USBR (2010, 2016)	Reports	BPA
44. DOI OIG Evaluation Report of DOI Workers Comp Pgm (2005)	Reports	USDOI
45. DOI OIG Evaluation Report of DOI Workers Comp Pgm (2016)	Reports	USDOI
46. DOI OSH Annual Report (2012) – all Bureaus	Reports	USDOI

Description	Data Type	Source
47. DOI OSH Annual Report (2015) – all Bureaus	Reports	USDOI
48. DOI SOH Evaluation of USBR (2013)	Reports	USDOI
49. GCPO Safety Status Briefing - M. Simpson (2017)	Reports	PNR
50. GCPO Staffing Study (2012; final report, briefing PPT)	Reports	MWH
51. OSHA audits/citations/complaints at PNR (2010-2013; n=7 complete, 8 incomplete, 19 missing)	Reports	OSHA
52. PNR Safety Deficiencies Report (DSIS, 2010-2016)	Reports	PNR
53. PNR Safety Management Evaluations (SME) for the Region (2011), Grand Coulee (2014), and Snake River Area (2014)	Reports	PNR
54. PNR Serious Accident Investigation (SAI) reports for the Keys PGP (2013) and Pinto Dam (2013)	Reports	PNR
55. Reclamation Rapid Improvement Work Team summary (2014)	Reports	USBR
56. Reclamation reports from 21 Safety Action Teams (2016) (n=21 reports)	Reports	USBR
57. Reclamation SOH Annual Reports (2010-2014)	Reports	USBR
58. TOPF S,H&E Safety Culture Assessment Reports (Nov 2010)	Reports	TOPF
59. TOPF S,H&E Safety Culture Assessment Reports (Sept 2013)	Reports	TOPF
60. OPM Federal Employee Viewpoint Survey (FEVS) Results 2015	Surveys	USOPM
61. OPM Federal Employee Viewpoint Survey (FEVS) Summary 2015	Surveys	USOPM
62. OPM The Keys to Unlocking Engagement (FEVS 2015) Tech Report	Surveys	USOPM
63. Reclamation Baseline Assessment of Employee Perceptions of Safety Culture (Safety Action Team #14)	Surveys	USBR
64. TOPF Safety, Health and Environmental Culture Assessment	Surveys	TOPF
65. DOI Occupational Health & Safety Training Guide (2009)	Trainings	USDOI
66. OSHA Resource for Development and Delivery of Training to Workers (2015)	Trainings	OSHA
67. TOPF Leadership for Safety: USBR	Trainings	TOPF
68. TOPF Safety Culture Shift Process (all employee training)	Trainings	TOPF
69. PNR Employee Directory (2014-2016)	Miscellaneous	PNR
70. PNR Facility and People Organizational Chart (multiple years)	Miscellaneous	PNR
71. Reclamation -IBEW general labor agreement	Miscellaneous	USBR
72. Reclamation SOH Directory (multiple years)	Miscellaneous	USBR
73. U.S. White House Executive Order 13673 (July 2014) –safe workplaces	Miscellaneous	US Pres.

[a] Not all years were electronically available at all sites.

Appendix B. Safety Culture Constructs by Type (with source references)

Construct Type	Construct Name	Source Reference by Purpose in Safety Culture Research		
		Defines "Safety Culture"	Assessment Tool	
			Peer-Reviewed	Government/Trade
Psychological	Values	Cox & Cox 1991, Fang et al 2006, Glendon and Stanton 2000, Guldenmund 2000, Hale 2000, Lee 1996, HSC 1993, Uttal 1983, Wiegmann et al 2002, Williamson et al 1997	Cox & Cheyne 2000, Geldart et al 2010, Reniers et al 2011	USBR Team 14 2015
	Perceptions	Brown & Holmes 1986, Cabrera et al 1997, Cooper & Philips 1994, Cox & Cox 1991, Coyle et al 1995, Dedobbeleer & Beland 1991, Glennon 1982, Hale 2000, Kennedy and Kirwan 1998, Lee 1996, Stroeve et al 2011, HSC 1993, Zohar 1980	Geldart et al 2010	USBR/TOPF 2010
	Beliefs	Brown & Holmes 1986, CBI 1991, Cooper 2000, Cooper & Philips 1994, Cox & Cox 1991, Fang et al 2006, Hale 2000, Ostrom et al 1993, Pidgeon 1991, Richter and Koch 2004, Turner et al 1989, Uttal 1983, Williamson et al 1997	Cox & Cheyne 2000, Cheyne et al 2002, Geldart et al 2010	USBR/TOPF 2010, USBR Team 14 2015
	Attitudes	Cox & Cox 1991, Coyle et al 1995, Glendon and Stanton 2000, Guldenmund 2000, Hale 2000, INSAG 1991, Kennedy and Kirwan 1998, Lee 1996, Mohamed 2003, Ostrom et al 1993, Pidgeon 1991, Stroeve et al 2011, Turner et al 1989, HSC 1993, Wiegmann et al 2002	Grote & Künzler 2000, Mearns et al 2001, Cheyne et al 2002	USBR/TOPF 2010, USBR Team 14 2015, CDC
	Commitment	Cooper 2000, Lee 1996, Stroeve et al 2011, HSC 1993, Wiegmann et al 2002	Grote & Künzler 2000	USBR/TOPF 2010
	Norms	Cooper 2000, Glendon and Stanton 2000, Guldenmund 2000, Hale 2000, Kennedy and Kirwan 1998, Pidgeon 1991, Turner et al 1989, Uttal 1983		USBR Team 14 2015
	Responsibility	Geller 1994, Glendon and Stanton 2000, Stroeve et al 2011, Wiegmann et al 2002	Cox & Cheyne 2000, Grote & Künzler 2000, Reniers et al 2011	USBR/TOPF 2010
	Knowledge		Cox & Cheyne 2000, Grote & Künzler 2000, Reniers et al 2011	USBR/TOPF 2010, USBR Team 14 2015, NIOSH
Behavioral	Competencies	Lee 1996, HSC 1993	Grote & Künzler 2000, Reniers et al 2011	CDC
	Behaviors	Cooper 2000, Glendon and Stanton 2000, Glennon 1982, Guldenmund 2000, Hale 2000, Kennedy and Kirwan 1998, Lee 1996, Mohamed 2003, Niskanen 1994, Ostrom et al 1993, Pidgeon 1991, Richter and Koch 2004, Stroeve et al 2011, Turner et al 1989, HSC 1993, Uttal 1983, Wiegmann et al 2002	Cox & Cheyne 2000, Grote & Künzler 2000, Mearns et al 2001, Geldart et al 2010, Reniers et al 2011	USBR/TOPF 2010, USBR Team 14 2015
	Communication	Stroeve et al 2011, HSC 1993, Wiegmann et al 2002	Cox & Cheyne 2000, Grote & Künzler 2000, Cheyne et al 2002, Reniers et al 2011	USBR/TOPF 2010, USBR Team 14 2015, NIOSH
	Incident reports		Mearns et al 2001, Cheyne et al 2002	USBR/TOPF 2010, USBR Team 14 2015, NIOSH
	Teamwork / Social Support		Grote & Künzler 2000, Mearns et al 2001, Cheyne et al 2002	USBR/TOPF 2010, CDC
	Learning / Adaptation	Stroeve et al 2011, Wiegmann et al 2002		

Construct Type	Construct Name	Source Document's Relevance to Safety Culture		
		Defines "Safety Culture"	Provides Assessment Tool	
			Peer-reviewed	Trade
Org - Context	Funding / Fiscal		Grote & Künzler 2000	USBR Team 14 2015
	Time / Workload		Cox & Cheyne 2000, Grote & Künzler 2000, Cheyne et al 2002, Geldart et al 2010	USBR Team 14 2015
	Turnover rate		Geldart et al 2010	
	Labor involvement in decision-making		Grote & Künzler 2000, Geldart et al 2010	USBR/TOPF 2010, USBR Team 14 2015, NIOSH , CDC
Org - System	Policies	Cabrera et al 1997, Niskanen 1994, Ostrom et al 1993	Cox & Cheyne 2000, Grote & Künzler 2000, Mearns et al 2001, Cheyne et al 2002, Geldart et al 2010, Reniers et al 2011	USBR/TOPF 2010, USBR Team 14 2015, NIOSH
	Procedures	Niskanen 1994, Ostrom et al 1993, Pidgeon 1991, Turner et al 1989, HSC 1993, Uttal 1983	Grote & Künzler 2000, Mearns et al 2001, Geldart et al 2010, Reniers et al 2011	USBR/TOPF 2010, USBR Team 14 2015, NIOSH
	Org Structure	Pidgeon 1991, Turner et al 1989, Uttal 1983	Grote & Künzler 2000, Geldart et al 2010	USBR/TOPF 2010, USBR Team 14 2015
	System Evolution	Wiegmann et al 2002	Grote & Künzler 2000, Cheyne et al 2002, Reniers et al 2011	USBR/TOPF 2010, NIOSH
	Documentation (e.g. technical)		Grote & Künzler 2000, Reniers et al 2011	USBR/TOPF 2010
Org - Management	Management decisions/reactions	Wiegmann et al 2002	Cox & Cheyne 2000, Grote & Künzler 2000, Mearns et al 2001, Cheyne et al 2002, Geldart et al 2010	USBR/TOPF 2010, USBR Team 14 2015, NIOSH , CDC
	Attention to safety issues	Cooper 2000, INSAG 1991	Cox & Cheyne 2000, Grote & Künzler 2000, Mearns et al 2001, Cheyne et al 2002, Reniers et al 2011	USBR/TOPF 2010, USBR Team 14 2015, NIOSH , CDC
	Risk assessments	CBI 1991, Cooper 2000, Stroeve et al 2011	Reniers et al 2011	USBR Team 14 2015, NIOSH
	Training / Education	Glendon and Stanton 2000	Grote & Künzler 2000, Mearns et al 2001, Cheyne et al 2002, Geldart et al 2010, Reniers et al 2011	USBR/TOPF 2010, USBR Team 14 2015, NIOSH
Org - Environment	Work environment	Cabrera et al 1997, Hale 2000, Stroeve et al 2011, Zohar 1980	Cox & Cheyne 2000, Grote & Künzler 2000, Mearns et al 2001, Cheyne et al 2002, Reniers et al 2011	USBR Team 14 2015, CDC
	Exposure to hazards	Glennon 1982, Guldenmund 2000, Hale 2000, Pidgeon 1991, Turner et al 1989	Cheyne et al 2002, Reniers et al 2011	USBR Team 14 2015
	Safety equipment / hardware		Cox & Cheyne 2000, Grote & Künzler 2000, Reniers et al 2011	USBR/TOPF 2010, USBR Team 14 2015, NIOSH
	Maintenance / inspection		Grote & Künzler 2000, Mearns et al 2001, Reniers et al 2011	USBR/TOPF 2010, NIOSH
	Ergonomics		Reniers et al 2011	CDC

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Appendix C. Interview Confidentiality Statement

Thank you for coming to speak with us today. This copy of the confidentiality statement is for you to keep. We will review it with you and ask for your consent before we begin this interview.

Who We Are
We are from the UNC Gillings School of Global Public Health which is part of The University of North Carolina at Chapel Hill. Our team specializes in helping organizations assess and improve their policies, environments, and systems to provide healthy and safe living for their workers, families, and communities.

Why We Are Visiting You
PNR has contracted us to assess the safety culture in the region. We are visiting a few key facilities in each Area, and speaking with employees at those locations. We are hoping to learn more about your type of job at PNR, some of the safety issues related to that type of work, and how you think your job could be made safer.

About this Interview
This conversation will last 30 - 45 minutes. We will be asking questions and discussing some of your experiences and opinions about your type of job. Sometimes we'll be asking you about your direct experience. Sometimes we'll ask you to comment on information we've learned elsewhere (for example, from the Team 14 survey). We'll be taking notes during our conversation, but we are not audio recording this conversation.

Confidential Conversation
Everything you say in this room will be kept confidential by us. We will assign this conversation an ID number so that your name will not appear in our notes. We want to assure you that no one from PNR or Reclamation will read our notes from this conversation or know the specific things you say.

We will combine what we learn in all these interviews, and identify patterns that reveal information about PNR's safety culture and how it could be enhanced. In our reports and presentations, we will not be identifying anyone from these interviews.

University IRB clearance
We submitted a project description to our university's Institutional Review Board (IRB) for the protection of human subjects in research, and we were cleared to proceed with our project.

Our Contact Information
We want to provide you with a copy of this assurance of confidentiality, and also our contact information in case you have any questions or other thoughts you want to share later on.

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