

**Glen Canyon Dam Adaptive Management Work Group
AMWG Meeting Agenda Item Information
August 30-31, 2005**

<u>Agenda Item</u> Glen Canyon Dam Operations: Fire Impact on Flows	<u>Day and Time</u> August 31, 10:15-11:00
<u>Presenters</u> Ken Rice, Glen Canyon Dam Manager, Bureau of Reclamation Clayton Palmer, Manager, Environmental Planning and Resource Analysis, CRSP Management Center, Western Area Power Administration Representatives from the Federation of Fly Fishers, Grand Canyon National Park, and Grand Canyon River Guides will also make brief (two-minute) presentations on the effects of the change in flows.	
<u>Previous Action Taken</u> <input type="checkbox"/> By AMWG: _____ <input type="checkbox"/> By TWG: _____ <input type="checkbox"/> By an Ad Hoc Group: _____ <input type="checkbox"/> Other: _____	
<u>Action Requested</u> <input checked="" type="checkbox"/> Information item only; we will answer any questions.	
<u>Background Information</u> <input checked="" type="checkbox"/> I have attached the background information to be included in the AMWG packet that is distributed 30 days before the meeting, and posted on the website. Please see the attached article from the WAPA newsletter, also found at www.wapa.gov/newsroom/cct/2005/july15/27no141.htm . <input checked="" type="checkbox"/> I will bring detailed handouts to the meeting, plus a digital file of those handouts for posting on the website. In lieu of handouts to be included in the agenda packet, the following is a synopsis or outline of my presentation: The fires in Arizona meant a loss of power, which affected flows. Ken Rice and Clayton Palmer will talk about the impact of the fires on GCD operations and flows. Joe Alston from Grand Canyon National Park, André Potochnik from Grand Canyon River Guides, and Tim Steffen from the Federation of Fly Fishers will make two-minute presentations on the effects of the change in flows on their stakeholders.	

Pinnacle Peak lines see peril from fire by Dennis Schaefer

A good wet winter and early spring brought Arizona the moisture needed to grow great vegetation. However, early summer brought scorching heat, and now dry vegetation quickly turned to fuel that fed the Cave Creek Complex fire, sparked by two lightning strikes June 21.

For Western, the first sign of trouble came June 22 when the Pinnacle Peak-Flagstaff No. 1 345-kV line (see <http://www.wapa.gov/newsroom/cct/2005/july15/27no141a.htm> for photos) tripped from the fire's smoke. As the fire continued to rage, the high-mountain desert turned to a charred, blackened moonscape of burnt trees, shrubs and cactus, repeatedly tripping Western's Pinnacle Peak-Flagstaff No. 1 and 2 lines.

As day turned into night, DSW¹ Dispatch recorded at least eight more trips on the lines. Despite these frequent trips, DSW staff reassured Arizona Public Service and Salt River Project that it would continue to keep these lines in service, unless fire crews requested they be taken down for crew safety.

Immediately, both utilities ramped up standby generation in event these lines went down. At the same time, DSW and Colorado River Storage Project Management Center staff worked on transmission scheduling plans.

When the line tripped again June 23, DSW Dispatchers **Cal Ingram** and **Larry Edwards** decided it was time to discuss their operational concerns with the team trying to contain the Cave Creek fire, burning about 30 miles northeast of Phoenix. "Our involvement with the fire team started out pretty small, just like the fire," Ingram said. "But after two days of frequent line trips, Larry and I just thought we should meet with them."

Exchanging info with fire crews

That evening they went to a briefing, carrying vital information for the firefighters. "We gave them maps of our power lines and the western grid," Edwards said. "It was necessary for us to communicate to them where the lines were, what they would be dealing with working near the lines and, most importantly, I wanted them to know we were there to lend any assistance we could.

"We wanted the fire crews to understand that the fire's smoke ionizes the air around conductors and can lead to arcing, where electricity from the line jumps to the ionized smoke particles—sort of like miniature lightning bolts. In addition, the carbon from the burned materials breaks down into fine dust and ash that contaminates the insulators," he explained.

¹ Desert Southwest office.

By July 25, the fire had tracked about 20 miles of the Pinnacle Peak-Flagstaff line. With all the dense smoke, the lines arced several times while the fire crews battled the blaze. Around 4:30 p.m., the lines tripped offline.

Glen Canyon backs off generation

When both the No. 1 and No. 2 lines tripped out, there was nowhere for the power to go so generation dropping schemes automatically reduced generation at Glen Canyon powerplant. "In this case, the outage caught us by surprise," said Montrose Marketing Manager **Jeff Ackerman**. "When both lines tripped, it was pretty chaotic. We were worried about environmental restrictions governing how much water we could save at Glen Canyon vs. the minimum we are required to spill, as well as ramping restrictions once the lines came back on."

The loss of both lines also meant there was no Colorado River Storage Project transmission between Glen Canyon power plant in the north and loads in Arizona. "In layman's terms," **Tony Montoya**, DSW Operations manager said, "reinserting the lines after de-energization was just as problematic as the initial loss of transmission. It's like trying to change gears in a car with a manual transmission and there is no clutch. You have a motor (Glen Canyon Powerplant) running and you have a transmission gearbox spinning (load in Phoenix), but there is no clutch to synchronize the two together. You have to adjust the output of the motor to connect things up, and with a motor the size of Glen Canyon powerplant, this is an effort."

However, in an emergency such as this fire, dispatchers must be able to improvise, reroute and reschedule energy for the safety of the fire crews. "We worked quickly to make sure we could continue to meet our firm power customer loads. We activated the Southwest Reserve-Sharing Group to put some extra generation on the grid while we backed off at Glen Canyon. That gave us some breathing room for an hour until we could figure out another way to supplement loads," Ackerman added. "We found a work-around to get firm loads served. We had to change configurations on the transaction tags so that schedules would not be curtailed if the line tripped again."

In fact, Western scheduled some generation from Hoover Dam to cover what was lacking from Glen Canyon. "We'll have to pay back that generation, but we really appreciate the DSW Control Area and Hoover for supporting us. The financial costs of the outage and generation loss should be minimal since we'll have some surplus energy from Glen Canyon in July and August," Ackerman said.

De-energizing lines for fire fighter safety

Incident Commander for the Cave Creek Fire Jeffrey Whitney asked DSW if the Pinnacle lines could stay de-energized the following day, June 26, to allow fire fighters near the lines to work in a much safer environment, without having to worry about it arcing from the smoke. After DSW staff brought the lines back in service about 9:30 p.m., June 25, they informed the Incident Commander the lines could be de-energized for fire crew safety the next day at 11 a.m.

With the lines temporarily out of service on Sunday, the fire fighters gave it their all, working in the right of way, with the understanding that, even though the line was de-energized, they were not grounded and had to be treated as if they were energized. They battled the blaze, but as the day melted away, the fire raged further west and northeast following the Pinnacle Peak lines. But how long would Western be able to reroute and reschedule energy without those 345-kV lines? Monday, June 27, was a workday, and electrical loads were expected to be higher as were temperature forecasts for the Phoenix metropolitan area. DSW staff were able to re-energize the lines late Sunday night.

By Monday morning, more than 800 fire fighters on scene had contained the Lousy fire—that burned 2,916 acres—and the Broad fire—that scorched 354 acres. In contrast, the Cave Creek fire had not been squelched. It had already consumed 82,786 acres and was still going strong.

DSW prepared for the worst, discussing contingency plans as the fire continued its destructive path under the 345-kV line. The fire continued its westerly and northerly push. Fire fighters grew weary, but were determined to gain the upper hand. “It’s tough,” one fire team member said, “to see all this destruction, and try to help. But Mother Nature just won’t let go yet.” Fortunately, the fire did not damage the transmission line structures or conductor, and the major concern for Western was related to smoke contamination.

By July 3, fire fighters had contained the fire. After 13 days and with more than 248,000 acres of forest and private land burned, the Cave Creek fire ended its threat to Arizona communities and Western’s power lines.

(Note: Schaefer is a DSW public affairs specialist and served as liaison between Western and the Fire Incident team during the Cave Creek fire.)