

BUREAU OF RECLAMATION
FACILITIES INSTRUCTIONS, STANDARDS & TECHNIQUES
Volume 1-7

NUMBERING SYSTEMS

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1.-STANDARD TRANSMISSION LINE STRUCTURE NUMBERING SYSTEM

The standard structure numbering system used on all Reclamation transmission line structures was adopted by the Bureau of Reclamation in 1948. The system consists of two numbers

arranged thus: $\frac{25}{7}$ or 25/ 7 which represents

the mile distance and number of structures from a reference point. This example describes the seventh structure beyond the 25th mile from the beginning, or the powerplant end of the power-line. Structure within the first mile should be

numbered $\frac{0}{1}$, $\frac{0}{2}$, or 0/ 1, 0/ 2 and so on. The

numbering should start at a significant location such as a major substation or switching station. The numbers should appear both at the base of the structure, and on the sign at the top, if one is provided for identification by aerial patrol.

2.-STANDARD SWITCH NUMBERING SYSTEM

Switch numbers are normally assigned by the Division of Engineering, Facilities Engineering Branch, Denver Office, during design, (fig. 1a) to maintain a uniform standard on all projects. Any changes or additions made should be shown on a marked copy of the single-line diagram and sent to the Division of Engineering, Attention: Code D-5210, Denver Office, so the drawings can be kept up to date.

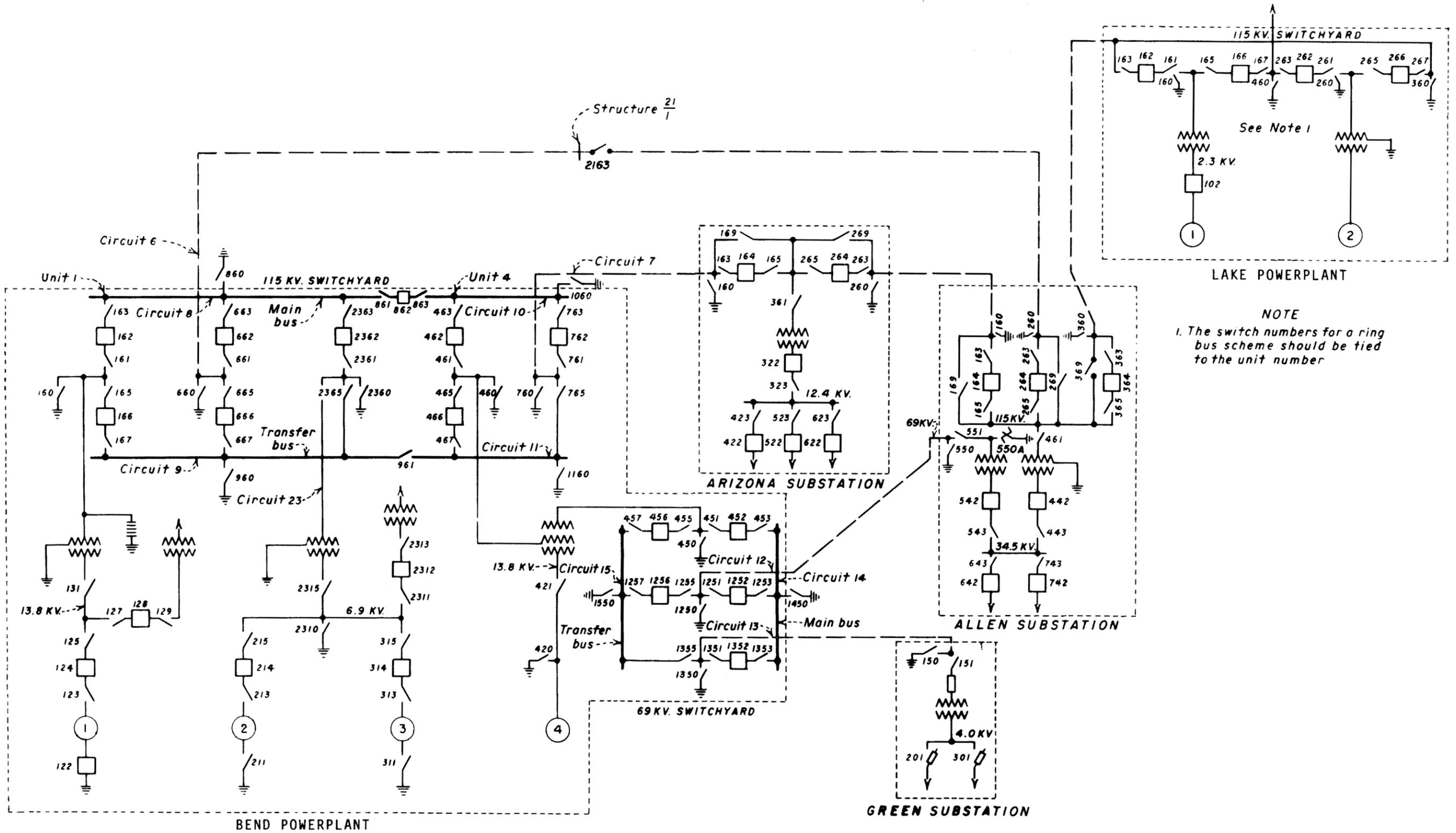


Figure 1a. - Standard switch numbering system for operating purposes.

EXPLANATION OF SYMBOLS

1. The switch-numbering scheme described herein and illustrated on the accompanying diagram of a hypothetical power system is to be used as a standard system for operating purposes by all Bureau projects. Switches not involved in system operation, such as low-voltage station-service switches, are not required to be numbered by this system.
2. The use of this numbering system will not affect the designations assigned by the design engineers and used for construction purpose. Switches will therefore have two designations.
3. The switch number consists of three symbols. The first symbol identifies an individual circuit and may vary from 1 to 99. The following rules apply to the assigning of the first symbol:
 - A. It is preferred that each circuit in a station has a different first symbol. Circuits emanating from a transformer are all considered as one circuit for purposes of numbering.
 - B. Where feasible, circuits on generating units will carry the same first symbol as the generator.
 - C. In substations it is preferred that low number first symbols be used on the highest voltage circuits with first symbols increasing as you work toward progressively lower voltage circuits. It is a good plan to reserve some numbers between high and low voltage series for possible future extensions.
 - D. At powerplants start with the lowest number at the generator or transformer neutral and work outward on the circuit. Where there are two powerplants on the same location, the first symbol may be a letter and a number, such as N6, R1, L4, etc.
 - E. Line sectionalizing switches not located at substations should use the line structure number (nearest mile) as the first symbol. The other symbols will be the same as for powerplants and substations. Switches at tap points on a line should be numbered the same as at substations and the tap point assigned a name.
4. The second symbol designates the general voltage classification of the circuit as follows:
 - 0 and 1 0 to 9.0 KV
 - 2 and 3 10 to 29 KV
 - 4 and 5 30 to 99 KV
 - 6 and 7 100 to 199 KV
 - 8 and 9 200 KV and above

5. The third symbol is used to discriminate between several switches or devices in a circuit. Numbers 2,4,6 and 8 designate circuit breakers or other automatic devices. The preferred use of these last symbols is as follows:
 - Use 2 for main breaker in any bus arrangement that permits isolating the breaker by tying its circuit to another breaker.
 - Use 4 for breaker in any single bus arrangement.
 - Use 6 for transfer bus breaker or bus tie breaker
 - Use 8 for drop-out type breaker.
 Label interruptor switches as circuit breakers if they are rated for load breaking.

- Numbers 0,1,3,5,7 and 9 designate disconnecting switches. The preferred use of these last symbols is as follows:
- Use 0 for grounding switches
 - Use 9 for by-pass switches
- Breaker disconnecting switches should be assigned the odd numbers on each side of the breaker using the higher number on the bus side of the breaker. Exception: on bus tie breakers, the disconnecting switches should have the same last symbol as switches in other bays that are connected directly to the main and transfer buses.
- Label fuses as disconnects.
- Numbers decrease as you move from the starting point on a bus toward any of the following:
- A. Load circuit
 - B. Transmission line
 - C. Secondary or tertiary of a transformer
 - D. Generating unit

- When moving from a bus to the primary of a transformer it may be necessary to deviate from this rule in some instances.
6. Example of switch numbering. The symbols for Big Bend Powerplant Switch No. 1351 are determined as follows:
 - A. The first symbol is 13 indicating circuit 13
 - B. The second symbol is 5 indicating 30 to 99 KV (69 KV)
 - C. The third symbol is 1 indicating a disconnect switch.

5-27-51 D-111	REVISED AND REDRAWN.
1-29-57 D-J.E.G.	ADDED AUTO. GRD. SW. 530A.
	
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION STANDARD DESIGN STANDARD SWITCH NUMBERING SYSTEM FOR OPERATING PURPOSES	
DRAWN -	SUBMITTED -
TRACED - E.W.C.	RECOMMENDED - E.R. Schurch
CHECKED -	APPROVED - W.L. Nursuegos
DENVER, COLO.	APR. 10, 1952
40-D-4847	

Figure 1a. - Standard switch numbering system for operating purposes.