

MEMORANDUM

TO: Beth Robrahn, Planning Director

FROM: Mike Barrie, Facility Siting Coordinator

RE: Planning Commission requests from October 19, 2009 meeting

DATE: January 26, 2009

This memo is being submitted in response to the October 27, 2009 Planning Commission Request.

Note: Only information not considered Critical Energy Infrastructure Information as defined by the Code of Federal Regulations, Title 18 Section 388, will be provided in responding to this request. If more technical or critical information is needed, all recipients will be required to execute a “Nondisclosure Agreement Regarding Use of Transmission or Generation System Documentation (see attached form).”

General Understanding of Power Distribution and Purpose of Project:

Electricity is provided to the City of Hailey by Idaho Power Company (IPC) via the Hailey (HALY) distribution substation located approximately at the corner of Carbonate Street and Sixth Avenue North in east Hailey. The distribution substation has occupied this location since 1948. This substation is used to transfer power to the distribution system of the area from the 138 kilovolt (kV) transmission line that connects Midpoint Substation north of Twin Falls to the Wood River Substation. Besides reducing the power to a usable voltage, the job of this distribution substation is to isolate faults in the distribution system. As presently configured, this station does not isolate faults in the transmission system.

The purpose of this project is to reconfigure the existing operating system of the substation to convert from a single source ‘tap’ to a double source ‘in and out’ configuration providing for automated power restoration and isolation of faults in the transmission system. The reconfiguration requires the installation of a ‘dead-end’ structure to accommodate the existing transmission tap, three air break switches, a circuit breaker and a new section of transmission line (five poles) to reconnect back into the existing 138kV system.

Information Requested by Commission:

3rd party review of the proposed new power transmission configuration: Attached are copies of the Hailey Substation General Location Plan along with Hailey Station Elevation & Section drawings showing equipment to be removed and added for the proposed reconfiguration. In the determination of this design, IPC considered several different factors, followed various standards and met numerous requirements. The proposed reconfiguration meets all necessary criteria to accomplish the purpose and need of the project,

abides by all safety standards, allows for future growth and complies with state, county and local ordinances. The attached drawings may be reviewed by a qualified third party to verify this design meets all necessary requirements.

Provide a “second source” – By converting the station to an “in and out” configuration, the station can be sourced independently from either Wood River Substation or Midpoint Substation.

Minimize visual impact – In compliance with Hailey Zoning Ordinance 532 (Public Utility Facilities), all equipment needed for this reconfiguration ‘does not exceed forty-eight feet (48) feet in height.’ The dimensions of the ‘dead end’ structure cannot be reduced any further without violating electrical clearance requirements. In addition, the ‘dead-end’ structure is composed of galvanized steel that will oxidize to a dull finish and become flat in appearance similar to the other structures in the substation within one to two years.

Maintain usability of the site – This reconfiguration design was reviewed by operating and maintenance personnel to ensure access is provided for those functions. In addition, the location of the new breaker and dead end were chosen to allow open access to the 102X switch for mobile transformer installation for maintenance and emergencies or for the future location of a second transformer.

Reduce noise – IPC acknowledges that the corona “buzzing” level in the vicinity of a wire connection on the dead end structure is abnormally high. Once the ‘second’ source has been connected to the station and the reconfiguration completed, adjustments and modifications can be preformed that will significantly reduce the ‘buzzing’ noise.

Maximize safety – This reconfiguration design complies with National Electric Safety Code (NESC) standards.

Balance the benefit of increased reliability with impacts to the neighborhood – The proposed reconfiguration is designed to restore power to HALY within 30 seconds for outages caused by transmission line ‘tripping’. The visual impacts of this reconfiguration affect fewer than 10 property owners. The benefit of reduced outage time affects everyone (at least 6,850 customers) served out of the Hailey Substation, including schools, airport, fire department, law enforcement, medical facilities and commercial business. Electrical reliability is also a very important factor in determining whether or not a new business will locate in a specific area.

Alternative designs: As this project evolved from conception to final design, several optional designs were discussed and considered. As a rule, after a final design is determined, IPC does not produce “alternative design” drawings. IPC is preparing computer enhanced graphic representations showing how the addition of the five poles proposed in the existing design would look from adjacent properties. The locations for the representative views were suggested by the P & Z Director. If a ‘third party’ is hired by the City to provide an alternate design that meets all applicable criteria and is acceptable to the Hailey P & Z Commission, IPC would consider using the alternate design. Examples

of applicable criteria include safety, maintainability, reliability, access, operational flexibility, allows for possible future additions and is in compliance with local ordinances.

Fence plan improvements – IPC acknowledges the existing chain link fence is in need of repair. IPC could provide additional visual screening of the substation equipment by replacing the existing fence fabric with a new chain link fabric with vinyl privacy fabric woven into it. This type of fencing is recommended as it provides adequate security and visual screening while at the same time allows enough transparency (5%) for security personnel to detect movement inside the fenced area. IPC uses this type of fencing on many of its substations located within residential areas. A photo of this type of fencing has been attached for review.

EMF transmission – On Monday, December 7, EMF levels around HALY substation were measured by Paul Ortmann, P.E., Senior Electrical Engineer for Idaho Power and are documented in the attached survey report. As noted in the report, throughout the U.S., few standards or limits have been established for exposure to electric and magnetic fields near electric power systems. Limits that have been established in the states of Florida, New York and Oregon are included in the survey report. The levels recorded near HALY are far below those limits.

Decibel (levels) of the existing lines and equipment – Actual decibel levels were not recorded but are addressed in the “Reduce noise” topic above.

Information on undergrounding: The Idaho Public Utilities Commission has determined that IPC may impose a surcharge to certain customers “to recover the incremental additional costs associated with underground construction or with construction on [a more expensive] route.” As an alternative to the surcharge, Title 50-2503 of the Idaho Code provides the ‘governing body of every city’ the authority to create local improvement districts to cover these additional costs. Based on past experience, undergrounding transmission lines, depending on the length of the project, can be up to 15 times more expensive than overhead transmission. The estimated cost for IPC to design and construct the new line tap (the five wood poles) portion of the reconfiguration project overhead is approximately \$45,000. Kerite Cable Services, a 3rd party contractor that specializes in undergrounding utilities, has provided a verbal “ball park” estimate of approximately \$300,000 to underground this same portion of the project. A more detailed cost estimate for the entire project can be prepared for the Commission if requested. It is the Company’s position, supported by the IPUC, that a customer requesting an alternate design would be responsible for any additional costs that may be incurred. If advance engineering fees associated with preparing an estimate are required, these fees may need to be paid in advance by the requesting party.

Additional Information:

Arc Flash study: Arc Flash Hazard Assessment Studies are performed to determine potential exposure to an electric arc for utility employees who work on or near exposed energized parts or equipment. An arc flash is the result of an arcing fault between energized conductors or an energized conductor and ground. The result is a rapid release of energy, which is called incident energy. Incident

energy is calculated based on the maximum available short circuit current, the system voltage, clearing time of the protective device and the distance of the employee from the source of the arc.

The addition of the circuit breaker, the dead end structure and other alterations resulting from this project do not increase the arc flash hazard. The substation is secured by a fence that has more than adequate distance from a potential arc flash in the substation to protect the public. Since the public is not authorized to be inside a substation unless accompanied by qualified and trained power company personnel, they should not be exposed to arc hazards related to the substation as long as they stay outside of the substation fence. Actual calculations of the arc study assessed for HALY in the spring of 2009 can be provided upon request.

Grounding: All grounding for the Hailey Substation is in compliance with station standards (i.e. NESC, WECC and ANSI). Copies of the Hailey Substation Grounding Plan can be provided upon request. Also, as noted in the attached EMF report, the grounded chain-link fence appears to reduce the magnitude of the electric field in some areas around the substation.

Other Safety Considerations: Other safety considerations associated with running additional current were not investigated as there are no voltage or current changes to the distribution system at Hailey. The voltage is not changing; it has always been 138 kV.

Additional Questions:

Explain whether increased reliability could be achieved with changes to the Wood River Transmission Station instead of the Hailey Substation: As mentioned earlier, HALY is currently tapped off of a 138 kV transmission line that connects Midpoint Substation (MPSN) with Wood River Substation (WDRI). This tap provides a single source of power to HALY. The purpose of this project is to install an automated power restoration system by basically providing a second source of power to the station. The reconfiguration will allow HALY to be fed from WDRI or MPSN. The same purpose would not be achieved by making changes to the WDRI transmission station.

Currently (without the proposed change): The transmission voltage at HALY is 138 kV and the distribution voltage is 13 kV. The transmission current entering HALY from the transmission line is 125 amps during peak loads and the distribution current leaving the station to the customers is approximately 1500 amps during peak loads.

The voltage will increase to 138 kV: Voltage levels are not changing with this project. Current levels are not changing either; it (the current on the transmission line) is just being re-routed through the station. During the peak load scenario mentioned above, approximately 225 amps flow on the transmission line from HALY to Midpoint, with 125 amps being “dropped off” at HALY. The remaining current, approximately 100 amps, flows on to Wood River Substation. With the new configuration, the total current (225 amps) will flow into the HALY station and 100 amps will flow out of the station (back onto the transmission line via the new five pole transmission line). All of the 138 kV conductor and equipment in the station is rated for 1200 amps.

Explain the existing reliability issues in Hailey (frequency of outages, length, etc): Prior to the most recent outage (December 24), since November 2005, there have been a total of seven outages over two minutes in duration. The total of those seven was 518 minutes or 8.633 hours of outages due to the Midpoint to Hailey transmission line tripping off. The longest of those outages was 220 minutes (nearly four hours). The proposed reconfiguration would have reduced most of the outages down to less than 30 seconds. With respect to the December 24 outage, the proposed reconfiguration may or may not have reduced the initial outage which was caused by the Midpoint – Hailey transmission line tripping due to ice buildup but it would have shortened the troubleshooting and restoration times.

How is the need for increased reliability determined? Idaho Power complies with the reliability standards set forth by the Western Electricity Coordinating Council (WECC), the American National Standards Institute (ANSI) and the North American Electric Reliability Coordinating Council (NERC). Additionally, IPC is under the oversight authority of both the Idaho and Oregon Public Utilities Commissions. Significant financial penalties can be imposed if there are reliability violations or if the company is found to be out of compliance.

What is the cost of the design proposed by Idaho Power? The estimated cost of the entire reconfiguration project, including engineering, design, materials and construction is approximately \$500,000. Permitting fees and associated labor costs are not included in this amount.

What criteria are used by Idaho Power to determine what design is selected? As previously explained, in the determination of the *most acceptable* design for the reconfiguration or upgrade of an existing facility such as HALY, several different factors, standards and requirements are considered. Criteria to be considered would include, but not limited to, does the design meet the purpose and need of the project, abide by all safety standards, allow for future growth and comply with state, county and local ordinances? In relation to an existing facility: is there sufficient room to reconfigure it while at the same time, maintaining a balance between services provided and the impacts that may result? Does the design achieve sufficient reliability without excessive cost? Does the design meet all applicable standards (see reliability comments above)? Will the design allow for additional upgrades in the future due to load growth or planned transmission additions? If all the above listed criteria are met the design would be considered acceptable.

Who bears the increased cost of alternative designs? As regulated by the Idaho Public Utilities Commission (IPUC), Idaho Power is obligated to build its infrastructure in the most cost effective manner possible. Idaho Power develops project designs that provide for least cost while adhering to consistent standards for service throughout its service area. The IPUC allows recovery of those reasonable costs. To the extent that customers desire the Company to pursue alternate designs at higher cost, it is the Company's position, supported by the IPUC, that the customer requesting the alternate design is responsible for the additional costs.

Other

Documentation of any easement agreements: IPC is the fee simple owner of the land on which all equipment and infrastructure needed for this reconfiguration project; therefore no easements have been acquired for this project.

Documentation of correspondence related to prior city approvals related to the substation, including approval of the new dead-end structure: There are no prior written city approvals related to reconfiguration of the substation or new dead-end structure. Contrary to public perception, throughout this entire process, IPC has been upfront with the City in its intentions and cooperative with all requests. Numerous emails and telephone conversations were exchanged between IPC personnel and Hailey City Planning & Zoning personnel before IPC began any construction. Discussions with the City staff about the substation reconfiguration began nearly a year ago. Following initial discussions in late March, P & Z staff indicated IPC would be exempt from design review for the substation work. That decision however was later changed and IPC was subsequently requested to submit a "Miscellaneous Application" for design review for only the portion of the project pertaining to the addition of the five new poles. During review of that application, the Hailey City attorney noted two of the five poles were in violation of the 48 foot height restriction for public utilities. He also concluded the substation was a 'non-conforming' use for the LR zoning and a CUP would be needed. The CUP application was subsequently submitted in September and IPC was scheduled for an October 19, 2009 public hearing. The hearing was intended to address the design review for the new poles and the CUP for the 'non-conforming use.' In the mean time, IPC, under the impression only the transmission line portion of the project needed reviewed, initiated the construction on the reconfiguration work inside the substation fence. The second week of September, Hailey's City attorney was informed of the internal configuration work currently underway and did not express any concern with IPC continuing it. He also expressed his opinion that the CUP application would be approved promptly after the meeting on the 19th. To help familiarize P & Z staff with the reconfiguration project prior to the scheduled October public hearing, IPC personnel provided a tour of the substation. The dead-end structure, air break and circuit breaker installations had been completed and were in place at the time of the tour. Though staff was not familiar with prior existing conditions at the substation before these changes were made, nothing appeared out of the ordinary or was noted during the tour. Since the tour, the single source 'tap' arrangement has been functionally restored to the substation and all other construction has stopped. In its present design the station can easily be converted to the 'in and out' configuration by simply adding the new section of transmission line and reconnecting back into the existing 138kV system.