

# **Trip Report**

## **2003 Annual Inspection of the Hallam Nuclear Power Facility, Hallam, Nebraska, D&D Site**

### **Summary**

An inspection of the Hallam Nuclear Power Facility (HNPF) was performed on March 10, 2003. The intermediate heat exchanger (IHX) structure is in excellent condition. A grassed knoll covering the old reactor foundation is in good condition; however, vegetation in one area may have succumbed to drought conditions. All wells are in excellent condition, although some are in the traffic pattern of current operations and are a nuisance to the power plant operators. There have been no significant trends in the ground-water monitoring data. An evaluation of the monitoring program is being made to determine if sample locations, frequency, and analytes are appropriate. Maintenance items include continued, routine care of the grass over the buried reactor foundation and repair of a small area of the grass cover where soil was inadvertently removed. There is no requirement for a follow-up inspection.

### **1.0 Introduction**

This report presents the results of the annual U.S. Department of Energy (DOE) inspection of the HNPF at Hallam, Nebraska.

T. G. Kirkpatrick (Chief Inspector) and M. R. Reed (Assistant Inspector), both of S.M. Stoller Corporation, the Technical Assistance Contractor at the DOE Grand Junction Office (GJO), conducted the inspection on March 10, 2003. Todd Chinn of the Nebraska Public Power District (NPPD) acted as an escort through the power plant. The inspection was conducted by the DOE Long-Term Surveillance and Maintenance (LTSM) Program personnel in accordance with the *Long-Term Surveillance Plan [LTSP] for the Hallam Nuclear Power Facility, Hallam, Nebraska* (DOE Grand Junction, Colorado, Office, September 1998), and procedures established by DOE-GJO for site inspections.

The purposes of the inspection were to confirm the integrity of the IHX structure and the grassed cover over the foundation of the former reactor building and to examine the condition of DOE monitor wells.

### **2.0 Inspection Results**

Features and photograph locations (PLs) discussed in this report are shown on the attached figure.

The HNPF site consists of :

1. The IHX, entombed in a waterproofed above-grade concrete structure.
2. A massive, below-grade, reinforced concrete structure, once the foundation of the reactor and now covered with a waterproof membrane, soil, and grass. Fixed radioactive materials remain at three principal locations within this structure.
3. Nineteen monitor wells.

Both structures and all wells are at the Sheldon Power Station, an active coal-fired power plant owned by the NPPD.

### **Intermediate Heat Exchanger**

The IHX is a massive block-like concrete sarcophagus, about 40 feet by 80 feet on a side, at the north end of the former HNPF. On the south side, it is two stories (about 25- to 30-feet) high. On the north side, the structure is one-story high. The roof on the two-story part is slightly crowned; the roof on the one-story part is sloped to drain. Repairs to the roof and walls made in 2001 remain adequate.

### **Buried Concrete Structure, Once the Foundation of the Former Reactor**

The old reactor foundation is buried beneath a waterproof membrane, soil, and grass. Today the buried structure appears as a low, flat-topped, grassed knoll, 1.4 acres in extent, immediately south of the IHX. The grass is a well-established lawn, and is generally in good condition. Grass on the side slope of the northeast corner of the knoll appears to have died (PL-1), most likely as a result of last year's drought. NPPD personnel replanted the grass in the autumn of 2002, but the success of this effort cannot be determined until the 2003 growing season has commenced. NPPD personnel said they would evaluate the grass in the spring and replant it if necessary.

Gravel was identified on the east side slope of the knoll (PL-2). NPPD personnel reported that ash from the power plant had been placed at this location. When the material was removed, the front-end loader inadvertently removed some of the grass cover. The resulting divot was filled with gravel to bring it to grade and prevent erosion. This gravel should be replaced with topsoil and replanted in accordance with the cover design.

Inspectors saw no evidence of recent erosion on the grass-covered knoll or the two areas identified above.

### **Monitor Wells**

DOE monitors ground water at this site in response to a request from the Nebraska Department of Health.

There are 19 wells in the monitoring network. DOE monitors the wells annually. Water levels are measured in each well. Samples are collected at all wells that produce sufficient water.

Monitor well OBS 3B had a damaged casing cover at the time of the 2002 inspection. NPPD personnel repaired the damage to this well casing and painted all of the above ground well casings bright red to make them more visible (PL-3). Flush mounted wells in high traffic areas (e.g., OBS 5A and OBS 5B) are covered with gravel and are difficult to locate. All wells are in excellent condition.

Results of monitoring (last conducted in July 2002) show the concentration in ground water of five contaminants of potential concern (COPCs) is very low and consistent from year to year. DOE is evaluating the monitoring results to determine if the present program is justified. Monitoring frequency, locations, analytes, constituent transport, radionuclide inventory, and isolation systems are being considered in the evaluation.

During the 2002 annual inspection, inspectors noted that many of the DOE wells are in or along traffic patterns associated with the current operation of the Sheldon Power Plant. NPPD personnel inquired about the possibility of eliminating monitor wells OBS 7B and 7C because of their location in the work area. NPPD believes that it is just a matter of time until a piece of heavy equipment collides with this pair of wells. DOE has agreed to monitor these wells through 2005.

### 3.0 Recommendations

1. Grass on the side slope of the northeast corner of the knoll has died and subsequently been reseeded (page 2).

**Recommendation:** Monitor the success of reseeded during the 2003 growing season; replant if necessary.

2. Gravel was placed in a divot created on the east side slope of the knoll by NPPD personnel (page 2).

**Recommendation:** Request NPPD personnel to remove the gravel, fill the divot with topsoil, and replant grass.

3. Results of monitoring indicate the concentration in ground water of five COPCs is very low and remarkably consistent from year to year. Some of the wells in the monitoring network interfere with current power plant operations (page 3).

**Recommendation:** Complete evaluation of the ground water monitoring program and implement recommendation, in consultation with Nebraska Department of Health and the plant operator.

## 4.0 Photographs

Photograph Location Number	Azimuth	Photograph Description
PL-1	225	Stressed vegetation on northeastern edge of the mound.
PL-2	270	Gravel fill replacing over-excavated area on the edge of the mound.
PL-3	30	Repaired and repainted well casings.



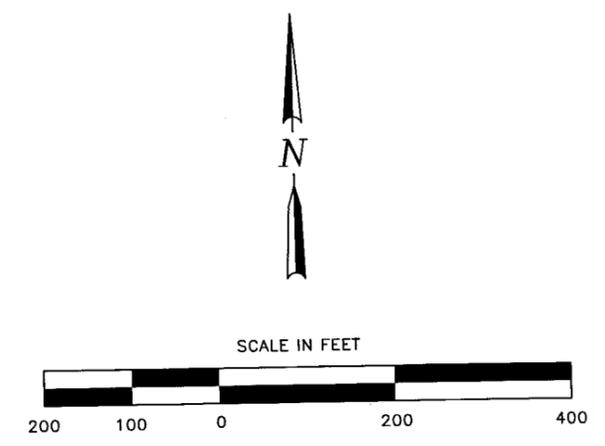
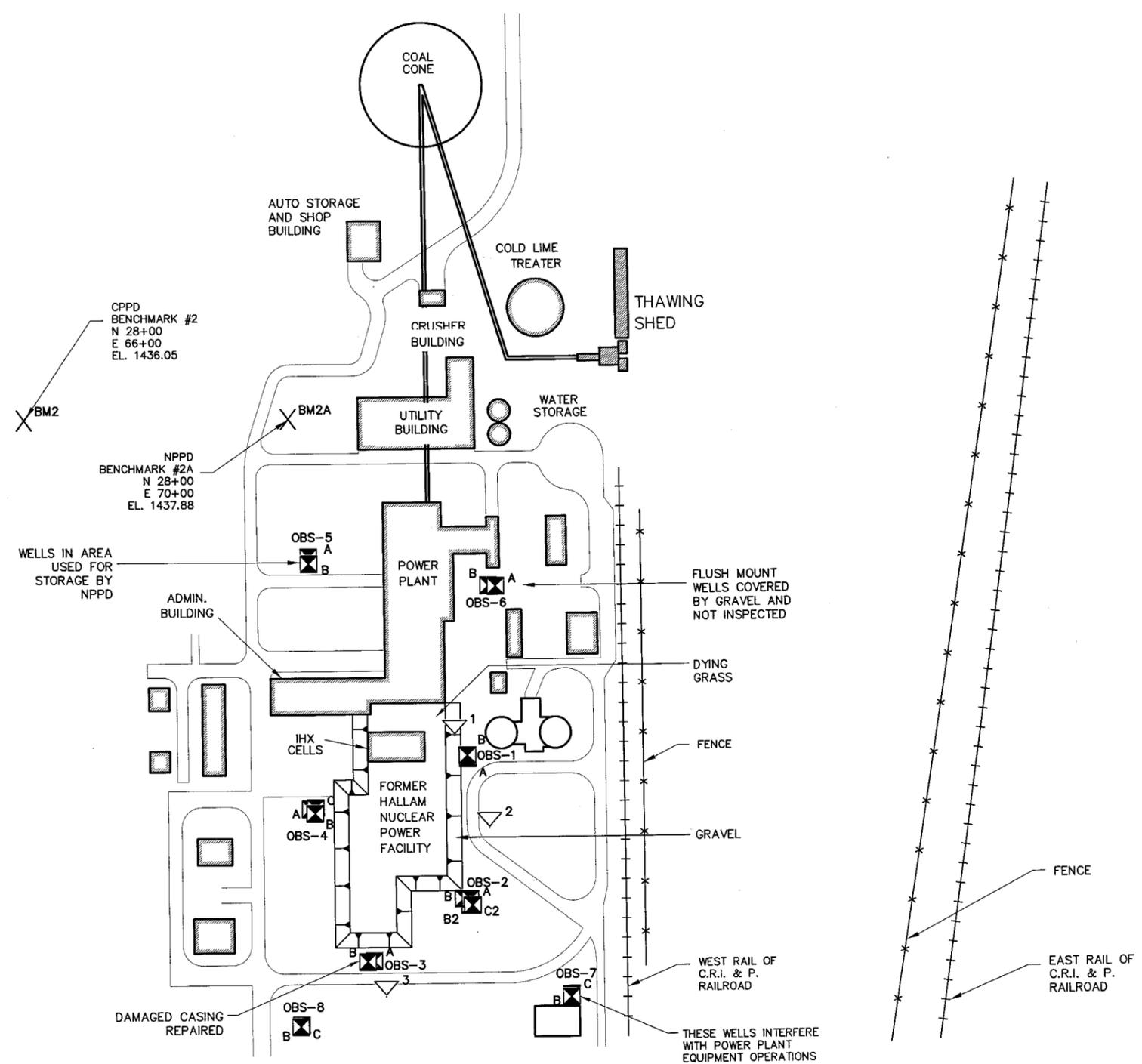
HAL 3/2003. PL-1. Stressed vegetation on northeastern edge of the mound.



HAL 03/2003. PL-2. Gravel fill replacing over-excavated area on the edge of the mound.



HAL 03/2003. PL-3. Repaired and repainted well casings.



**EXPLANATION:**

OBS-5 MONITOR WELL LOCATION  
 (A - SHALLOW WELL)  
 (B - DEEP WELL)  
 NOTE: 4C IS DEEPEST

BM2 BENCHMARK

IHX INTERMEDIATE HEAT EXCHANGER

NOTE:  
 OBS-SERIES WELLS SURVEYED IN RELATION TO CPPD BENCHMARK #2 AND NPPD BENCHMARK #2A. OTHER BORINGS AND SITE FEATURES (BUILDINGS, ROADS, ETC.) ARE SCHEMATIC AND ARE NOT SHOWN IN RELATIONSHIP TO THE BENCHMARKS.

ANNUAL INSPECTION CONDUCTED  
 MARCH 10, 2003

U.S. DEPARTMENT OF ENERGY GRAND JUNCTION OFFICE GRAND JUNCTION, COLORADO	Work Performed by S. M. Stoller Corporation Under DOE Contract No. DE-AC13-02GJ79491
2003 ANNUAL INSPECTION DRAWING HALLAM, NEBRASKA HALLAM NUCLEAR POWER FACILITY	
DATE PREPARED: APRIL 10, 2003	FILENAME: S0089800