

ATTACHMENT 2

DRESDEN FUEL PROCEDURE
DFP 800-20, OPERATION OF THE
WHITING REDUNDANT CRANE SYSTEM

8011100634

OPERATION OF THE WHITING
REDUNDANT CRANE SYSTEM

DFP 800-20
Revision 2
May 1976

A. PURPOSE

The purpose of this procedure is to expedite safe and efficient operation of the reactor building 125/9-ton crane within all analyzed limitations, for handling both normal loads and "restricted loads". The operating engineer will provide information as to which loads are to be considered "restricted loads".

B. REFERENCES

1. "Whiting 125/9 Ton Crane Operation and Maintenance Manual" from S&L.
2. S&L drawings 12E6511 through 12E6536.

C. PREREQUISITES

1. Prior to handling a restricted load over the 613' elevation, the MODE KEYSWITCH must be locked in the RESTRICTED mode.

D. PRECAUTIONS

1. Start all crane motions slowly.
2. Do not attempt to hoist loads that are not directly beneath the hook.
3. Do not attempt to drag or pull loads with the crane.
4. When crane travel approaches a limit, reduce speed.
5. Do not operate crane motors on resistance (i.e., intermediate controller positions) any longer than necessary.
6. Do not handle loads above an open reactor cavity or a spent fuel pool unless absolutely necessary.
7. When the main hoist is not loaded, avoid sudden hoisting action, especially near the upper travel limit. Such action may cause disabling of the lowering function, due to a false "loss of load" signal from the load monitor system.
8. Always use acceptable rigging methods when loading the hoists.

E. LIMITATIONS AND ACTIONS

1. Maximum loading.
 - a. The maximum load that may be handled with the main hoist is 250,000 pounds (125 tons).

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- b. The maximum load that may be handled with the auxiliary hoist is 18,000 pounds (9 tons).
- 2. Digital-readout load monitor system.
 - a. If, during crane operation, the load monitor receives a signal that the main hoist load is excessive, or that loss of load on the main hoist has occurred, the load monitor circuit will disable the hoisting function on overload or the lowering function on loss of load.
 - b. If an overload trip occurs, immediately ascertain the cause.
 - (1) If the trip is due to a real overload, correct the condition immediately by lowering the load.
 - (2) If the trip is due to failure of the load monitor, hoist operation may be restored by jumpering contacts 151 and H30 on relay CR1, in the auxiliary panel on the northeast corner of the trolley. Authorization from the shift engineer is required.
 - c. If a loss-of-load trip occurs, ascertain the cause.
 - (1) If the block has been unloaded from the reeving by over-lowering, reload by hoisting. Do this very cautiously, using the SLOW hoist speed and ensuring that the cables are positioned properly as the slack is taken up.
 - (2) If the trip is due to failure of the load monitor, hoist operation may be restored by jumpering contacts 152 and 154A on relay CR2, in the auxiliary panel on the northeast corner of the trolley. Authorization from the shift engineer is required.

NOTE

Disabling the load monitor by cutting its power is not recommended, since the lowering functions of the hoists will remain disabled.

- 3. Train length equalizer.
 - a. If, during crane operation, the respective lengths of the redundant cable trains become excessively different, the equalizer circuit will disable all crane functions and activate a rotating red light.
 - b. Following such a trip, all crane functions except hoisting may be restored by operating the EQUALIZER BYPASS keyswitch in the cab.

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- c. Full crane operation may be restored only by adjustment of train lengths at the equalizer bar.
- 4. Radiation monitor.
 - a. A radiation monitor reading of 20 mR/hr or greater will give a high rad alarm and cause all crane functions to be disabled.
 - (1) Notify Radiation Protection if this happens.
 - (2) Operation may be restored, only after authorization from Radiation Protection, by placing the radiation monitor bypass switch in the BYPASS position.
 - b. A radiation monitor reading of less than 0.1 mR/hr will give a low level alarm, indicating equipment malfunction, and cause all crane functions to be disabled.
 - (1) If radioactive materials are being handled and this happens, stop all crane operations and notify Radiation Protection.
 - (2) Handling of radioactive materials with a malfunctioning crane radiation monitor may be resumed only after authorization from Radiation Protection.
 - (3) Operation may be restored by placing the radiation monitor bypass switch in the BYPASS position.
- 5. Emergency stop.
 - a. Crane operation may be stopped using any of the STOP buttons on the walls for the 613' elevation.
 - b. Crane operation may be restored following such an emergency stop using the RESET button on the west wall for the 613' elevation.
- 6. Failure of the crane to operate may be due to one or more of the following malfunctions.
 - a. Grid broken.
 - b. Controller fingers making poor contact.
 - c. Fuse blown.
 - d. Motor brushes stuck.
 - e. Collector shoes making poor contact.
 - f. Power supply voltage low.

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- g. Slow speed motor overload tripped.
- h. Slow speed motor overspeed tripped.
- i. Slow speed motor pushbutton control open.
- j. AC motor overload on hoist speed controller.
- k. One of hoist restricted mode upper limit switches open when crane in RESTRICTED mode.
- l. Limit switch stuck.
- m. Relay stuck.

F. PROCEDURE (Refer to Attachment A, "Cab Control Diagram")

- 1. Place the motion controllers in the center (STOP) position.
- 2. CLOSE the main circuit breaker in the cab, plus any individual circuit breakers that are open.
- 3. Select cab or pendant control.
 - a. If the pendant is raised, lower it to the floor using the pendant RAISE/LOWER button in the cab.
 - b. Select either cab control or pendant control, using the CAB/FLOOR selector switch on the pendant.
- 4. Select the appropriate operational mode, using the mode selection keyswitch located on the pendant.
 - a. For normal loads, use NORMAL mode.
 - (1) Bridge, trolley, and hoist motions are restricted only by limits associated with physical travel capabilities.
 - (2) Bridge and trolley travel limit bypass functions are operable in NORMAL mode.
 - b. For restricted loads, use RESTRICTED mode.
 - (1) The main hoist must be within the restricted pathway (Attachment B) prior to selecting RESTRICTED mode.
 - (2) Bridge and trolley travel is restricted to the pathway specified in Attachment B.
 - (3) Bridge and trolley travel limit bypass functions are inoperable in RESTRICTED mode.

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- c. If cab control is to be used, raise the pendant, using the pendant RAISE/LOWER button in the cab.
5. Select the appropriate crane speed limits.
 - a. For normal loads, speeds are limited only by safe work practices.
 - b. For restricted loads, set hoist, trolley, and bridge speed limits.
 - (1) Set the hoist speed limit to 5 ft/min., using the selector keyswitch in the hoist speed control cabinet on the bridge.
 - (2) Set the trolley speed limit to 10 ft/min., using the selector keyswitch in the trolley speed control cabinet on the bridge.
 - (3) Set the bridge speed limit to 20 ft/min., using the selector keyswitch in the bridge speed control cabinet on the bridge.
6. Use of the 125-ton main hoist and the 9-ton auxiliary hoist.
 - a. The main and auxiliary hoists may be controlled from either the cab or the pendant.
 - b. START the hoist M-G set using the MAIN & AUX START push-button.
 - c. Use the hoist selector switch to select MAIN or AUX hoist operation.
 - d. For normal loads, select "normal" or "inching" speed.
 - (1) To select "normal" speed, place the hoist speed selector switch in the FAST position.
 - (2) To select "inching" speed (about 4 ft/min), place the hoist speed selector switch in the SLOW position.
 - e. For restricted loads, select "normal" speed.
 - f. Use the appropriate controls to move the hoist.
 - (1) For normal speed hoisting, use the UP/DOWN lever for control. This is a potentiometer control, enabling speed to be smoothly increased from stop to the limit. Return the lever to the center OFF position to halt motion with electrodynamic and electromechanical braking.

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- (2) For "inching", use the SLOW UP and SLOW DOWN pushbuttons for control. Release the pushbutton to halt motion and apply the brake.
- g. If the hoist is to be idle for several minutes, STOP the hoist M-G set using the MAIN & AUX STOP pushbutton.

7. Movement of the bridge and the trolley.

- a. Movement of the bridge and the trolley may be controlled from either the cab or the pendant.
- b. START the bridge and trolley M-G set, using the B&T START pushbutton.
- c. Move the appropriate levers to initiate bridge and trolley motion. These are potentiometer controls, enabling speed to be smoothly increased from stop to the limit; however, continuous operation at intermediate control positions is not desirable.
- d. Return the respective levers to the center OFF position to halt motion with electrodynamic and electromechanical braking.
- e. An additional manual hydraulic brake is provided in the cab, operated by a foot pedal, for stopping the bridge.
- f. If the bridge and trolley are to be idle for several minutes, STOP the bridge and trolley M-G set, using the B&T STOP pushbutton.

8. Operation of the main hoist load monitor.

- a. The load monitor panel is located on the trolley.
- b. The load on the main hoist, in hundreds of pounds, is indicated digitally on the load monitor panel.
- c. Upper and lower limits are established which disable crane operations outside the limited range of 0 to 250,000 pounds on the main hoist.
- d. Indicator lights are provided to show the relationship of the main hoist load to its upper and lower limits.
 - (1) For loads within the limits, the OVER lower limit and the UNDER upper limit lights will be illuminated.
 - (2) For loads in excess of 250,000 pounds, the OVER lower limit and the OVER upper limit lights will be illuminated.

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- (3) For loads below zero (e.g., broken cable), the UNDER lower limit and the UNDER upper limit lights will be illuminated.

NOTE

With the main hook unloaded, the load monitor readout will be several hundred pounds above zero. This added margin reduces the probability of a false loss-of-load trip.

9. Shutdown of the crane.
 - a. Place all motion controls in the OFF position.
 - b. STOP the hoist M-G set using the MAIN & AUX STOP pushbutton.
 - c. STOP the bridge and trolley M-G set using the B&T STOP pushbutton.
 - d. OPEN the main circuit breaker in the cab.

G. CHECKLISTS

1. None required.

H. TECHNICAL SPECIFICATION REFERENCES

1. None.

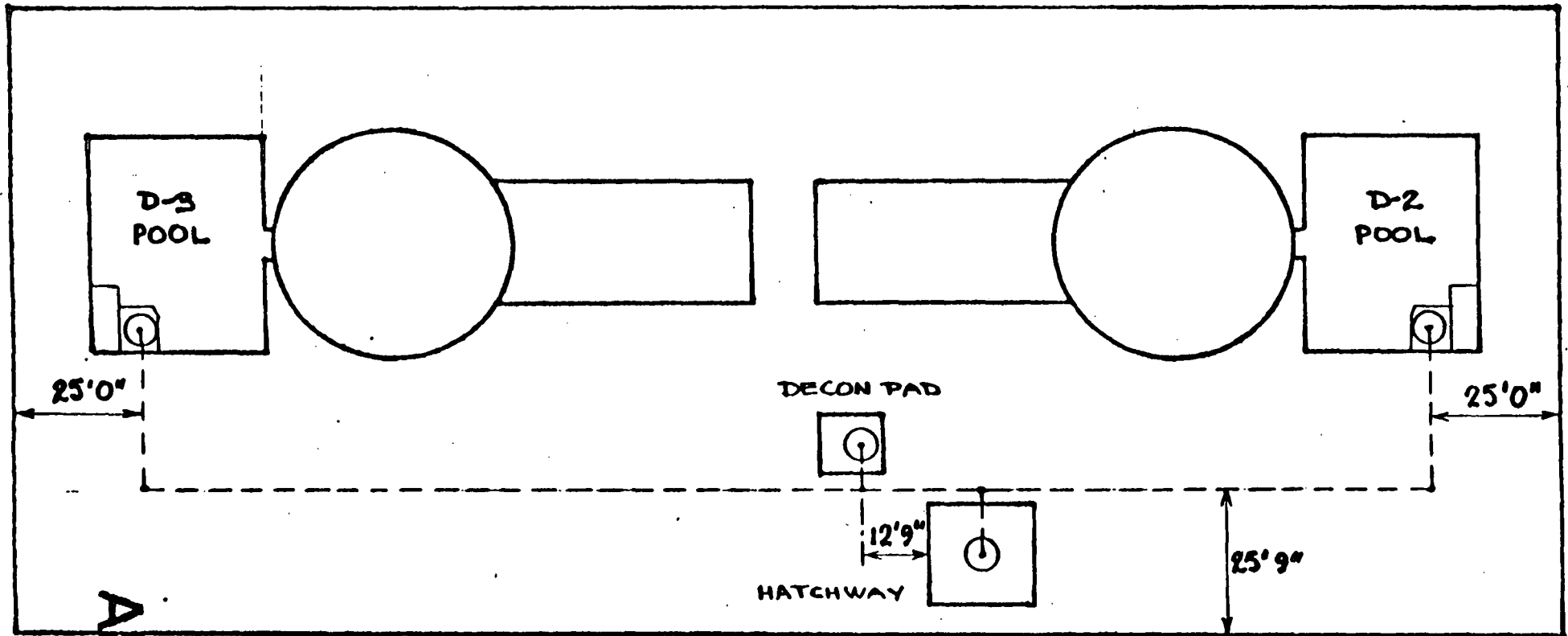
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D-2/3 REACTOR BUILDING REDUNDANT CRANE SYSTEM
 ALLOWABLE PATHWAY FOR RESTRICTED MODE



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ELEVATION 613'0"

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ATTACHMENT B

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