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RECIP.NAME RECIPIENT AFFILIATION
DENTON,H.R. Office of Nuclear Reactor Regulation, Director

SUBJECT: Forwards Phase II.b response to Encl 3,Section 2.4 of DG Eisenhut 801222 ltr re overhead handling sys operation for controls of heavy loads,per NUREG-0612.Two aperture cards available in PDR.

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December 3, 1982
AEP:NRC:0514F

Donald C. Cook Nuclear Plant Unit Nos. 1 and 2
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74
CONTROL OF HEAVY LOADS - PHASE II.b

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Denton:

This letter and its Attachments are Phase II.b of our response to Enclosure No. 3 to Mr. D. G. Eisenhut's letter of December 22, 1980. Phase II.b responds to Section 2.4 of Enclosure No. 3 and is being submitted on the schedule stated in our letter No. AEP:NRC:0514D dated July 12, 1982.

This document has been prepared following Corporate procedures which incorporate a reasonable set of controls to ensure its accuracy and completeness prior to signature by the undersigned.

Very truly yours,

R. S. Hunter
Vice President

RSH/sag
Attachment

cc: John E. Dolan - Columbus
M. P. Alexich
R. W. Jurgensen
W. G. Smith, Jr. - Bridgman
R. C. Callen
G. Charnoff
Joe Williams, Jr.
Resident Inspector at Cook Plant

A033

December 3, 1982
AEP:NRC:0514F

Donald C. Cook Nuclear Plant
Docket Nos. 50-315 and 50-316
License Nos. DPR-58 and DPR-74
CONTROL OF HEAVY LOADS - PHASE II.b

Mr. Harold R. Denton, Director

2.4 SPECIFIC REQUIREMENTS FOR OVERHEAD HANDLING SYSTEMS OPERATION IN PLANT AREAS CONTAINING EQUIPMENT REQUIRED FOR REACTOR SHUTDOWN, CORE DECAY HEAT REMOVAL, OR SPENT FUEL POOL COOLING

"NUREG 0612, Section 5.1.5, provides guidelines concerning the design and operation of load-handling systems in the vicinity of equipment or components required for safe reactor shutdown and decay heat removal. Information provided in response to this section should be sufficient to demonstrate that adequate measures have been taken to ensure that in these areas, either the likelihood of a load drop which might prevent safe reactor shutdown or prohibit continued decay heat removal is extremely small, or that damage to such equipment from load drops will be limited in order not to result in the loss of these safety-related functions. Cranes which must be evaluated in this section have been previously identified in your response to 2.1-1, and their loads in your response to 2.1-3-c."

2.4-1. "Identify any cranes listed in 2.1-1, above, which you have evaluated as having sufficient design features to make the likelihood of a load drop extremely small for all loads to be carried and the basis for this evaluation (i.e., complete compliance with NUREG-0612, Section 5.1.6, or partial compliance supplemented by suitable alternative or additionally design features). For each crane so evaluated, provide the load-handling-system (i.e., crane-load-combination) information specified in Attachment 1."

Response:

NONE

2.4-2. "For any cranes identified in 2.1-1 not designated as single-failure-proof in 2.4-1, a comprehensive hazard evaluation should be provided which includes the following information:"

2.4-2.a "The presentation in a matrix format of all heavy loads and potential impact areas where damage might occur to safety-related equipment. Heavy loads identification should include designation and weight or cross-reference to information provided in 2.1-3-c. Impact areas should be identified by construction zones and elevations or by some other method such that the impact area can be located on the plant general

arrangement drawings. Figure 1 provides a typical matrix."

2.4-2.b "For each interaction identified, indicate which of the load and impact area combinations can be eliminated because of separation and redundancy of safety-related equipment, mechanical stops and/or electrical interlocks, or other site-specific considerations. Elimination on the basis of the aforementioned considerations should be supplemented by the following specific information:"

(1) "For load/target combinations eliminated because of separation and redundancy of safety-related equipment, discuss the basis for determining that load drops will not affect continued system operation (i.e., the ability of the system to perform its safety-related function)."

Response:

The results of the heavy load drop survey were presented in Table 1 of letter No. AEP:NRC:0514E dated September 29, 1982. This survey identified 12 cranes and hoists that required further study. The attached Table A lists these 12 cranes and hoists and the Appendices which provide the results of our evaluations of the effects of heavy loads dropped from any of those 12 cranes and hoists. We believe that use of the matrise format shown in Figure 1 of Enclosure 3 is not meaningful for the following reasons. As explained in Appendix A to this Attachment, the Plant's design and construction is compact with the result that it is not possible to define load paths for the Auxiliary Building Crane. This fact coupled with the weight and size of the loads being transported, makes the use of an enveloping approach such as that taken in Appendices to this letter, a more informative and descriptive one.

(2) "Where mechanical stops or electrical interlocks are to be provided, present details showing the areas where crane travel will be prohibited. Additionally, provide a discussion concerning the procedures that are to be used for authorizing the bypassing of interlocks or removable stops, for verifying that interlocks are functional prior to crane use, and for verifying that interlocks are restored to operability after operations which require bypassing have been completed."

Response:

The only crane or hoist listed in Table A that relies on interlocks is the Auxiliary Building Crane. These interlocks were discussed in our response to Section 2.2, contained in letter No. AEP:NRC:0514A, dated August 27, 1982.

(3) "Where load/target combination are eliminated on the basis of other, site-specific considerations (e.g., maintenance sequencing), provide present and/or proposed technical specifications and discuss administrative procedures or physical constraints invoked to ensure the continued validity of such considerations."

Response:

Maintenance Procedure No. 12 MHP 5021.001.036, "Control of Heavy Loads in the Auxiliary Building", was developed to address the concerns of NUREG-0612. All loads of five tons or less listed in Table 2.1.3.C.1 of our letter No. AEP:NRC:0514C (hereby resubmitted as Attachment No. 1 to this letter) will be moved as close to the floor as practical, but in no case higher than 7 feet above the floor. The exceptions to this practice are the Glycol Tank (5 Tons) and the LSA Waste Boxes (2 Tons) which must be lifted to an elevation of 14' to clear associated piping. Special slings are designated for these loads having a minimum safety factor of 6.

The loads greater than five Tons have either a specially designed lifting beam, designated slings or are handled under a special procedure. These loads will be handled as close to the floor as possible.

2.4-2.c "For interactions not eliminated by the analysis of 2.4-2-b, above, identify any handling systems for specific loads which you have evaluated as having sufficient design features to make the likelihood of a load drop extremely small and the basis for this evaluation (i.e., complete compliance with NUREG-0612, Section 5.1.6, or partial compliance supplemented by suitable alternative or additional design features). For each crane so evaluated, provide the load-handling-system (i.e., crane-load combination) information specified in Attachment 1."

Response:

NONE

2.4-2.d "For interactions not eliminated in 2.4-2-b or 2.4-2-c, above, demonstrate using appropriate analysis that damage would not preclude operation of sufficient equipment to allow the system to perform its safety function following a load drop

(NUREG-0612, Section 5.1, Criterion IV). For each analysis so conducted, the following information should be provided:"

(1) "An indication of whether or not, for the specific load being investigated, the overhead crane-handling system is designed and constructed such that the hoisting system will retain its load in the event of seismic accelerations equivalent to those of a safe shutdown earthquake (SSE)."

(2) "The basis for any exceptions taken to the analytical guidelines of NUREG-0612, Appendix A."

(3) "The information requested in Attachment 4."

Response:

NONE

AEP:NRC:0514F

Table A

Evaluation Results

Item No.	Crane or Hoist Capacity	Location and Drawing *	Appendix
1	Auxiliary Building Crane 150T/20T	Auxiliary Building 12-5170	A
2	Containment Polar Crane - 250T/35T	Containment Building 12-5170	B
3	Circulating Water Pump and Screen House Crane - 30T	Circulating Water Pump and Screen House 12-516 and 12-5168	C
4	Diesel Generator Crane - 2T	Auxiliary Building 12-5167	D
5	Reciprocating Charging Pump Hoist - 2T	Auxiliary Building 12-5167	D
6	Centrifugal Charging Pump Hoist - 2T	Auxiliary Building 12-5167	D
7	Safety Injection Pump Hoist - 1-1/2T	Auxiliary Building 12-5167	D
8	Containment Spray Pump Hoist - 4T	Auxiliary Building 12-5166	D
9	Residual Heat Removal Pump Hoist - 3T	Auxiliary Building 12-5166	D
10	Main Steam Valve Hoist - 5T	Containment Buildings 12-5169	D
11	Recirculation Valve Hoist - 3T	Auxiliary Building 12-5167	D
12	Auxiliary Feedwater Pump Hoist - 2T	Turbine Building 12-5167	C,D

NOTE:

*The referenced drawings were attached to our letter No. AEP:NRC:0514E, dated September 29, 1982.

AEP:NRC:0514F
APPENDIX A
AUXILIARY BUILDING CRANE

Instead of looking at individual loads and load paths, the load with the worst combination of weight or size was allowed to drop anywhere within the crane travel (with one exception, noted below), and in any orientation. It was also assumed that the load is stopped by the lowest level. The load considered is a radiation shield (32 ft. long x 6 ft. wide x 3 ft. deep, weight of 55 Tons). No mitigating measures have been considered in the load drop analysis, such as the particular details of the building structure (i.e. columns, cross beams, components' stiffness, etc.) or the characteristics of the load itself. Based on the guidelines provided in NUREG-0612 Section 2.1-1, we have made the assumption that the load would penetrate to the lowest level, not taking into account the stopping power of the concrete structures, because we have not performed detailed structural analyses of the load drop. The discussion presented below is the result of this conservative assumption.

The only area excluded from the drop analysis was the spent fuel pit area which was discussed in our response to Section 2.2 contained in our letter No. AEP:NRC:0514A, dated August 27, 1982.

Due to the compactness of the plant and the size of the load, the following systems that are needed for normal plant shutdown or decay heat removal could be affected:

High Head Safety Injection System (HHSIS)
Essential Service Water System (ESWS)
Residual Heat Removal System (RHRS)
Letdown System (LS)
Component Cooling Water System (CCWS)
Spent Fuel Pit Cooling System (SFPCS)
Control Room Air Conditioning System (CRACS)

The load drop considered would damage several other safety-related systems which are not necessary for normal plant shutdown or decay heat removal.

The drawings attached to our letter No. AEP:NRC:0514C dated June 18, 1982 (response to Section 2.1.3.a) show on a component basis the equipment that could be damaged.

For the HHSIS, ESWS, RHRS, LS, CCWS, and SFPCS both redundant trains can be impaired by a load drop in the "Unsafe Drop Zone" noted in Drawing No. 12-5170 (attached). For the ESWS the load drop would damage valves, piping and cabling. For the HHSIS, RHRS, LS, CCWS and SFPCS the drop could also damage pumps and heat exchangers.

For the CRACS only one train could be impaired due to damage to cables. No valves, piping or components of this system are in the drop area.

Unique to Unit 1's design is a cable routing that brings power and control cables for the B motor-driven AFS pump through the drop area (extreme west edge, Item A, Drawing 12-5170 attached). However, even if this cable were destroyed, there would still be available, not only the A motor driven-pump and the turbine driven pump in Unit 1, but also the cross ties that allow the Unit 2 motor driven pumps to be used on Unit 1.

With respect to the SFPCS, if cooling is lost it would take the Spent Fuel Pit at least 8 hours to reach 180°F. Alternate cooling can be provided by this time (see FSAR Section 9.4).

Drawing 12-5170 shows both Safe and Unsafe Drop Zones (the Spent Fuel Pit is excluded via interlocks, see AEP:NRC:0514A, response to Section 2.2). These Drop Zones were developed by assuming that radiation shield mentioned above was the dropped load. As can be seen on the Drawing, it is not feasible to develop safe load paths, nor is it feasible to limit the crane movement only over the safe Drop Zone. However, we believe that the effects of the worst possible load drop which could prevent under very conservative assumptions the availability of normal cooldown and residual heat removal systems, are bounded for a certain period of time by the total loss of AC power event. Our mitigating actions for this event make use essentially of the turbine driven auxiliary feedwater pump and have been described in detail in our letter No. AEP:NRC:0537, dated July 7, 1981. As a matter of fact, several components not available during the station blackout event would be available in the case of the worst load drop such as the motor driven pumps and the ventilation system for the turbine driven auxiliary feedwater pump. Procedures and training for the station blackout event are in place as described in our letter No. AEP:NRC:0537B dated October 9, 1981.

In conclusion, although no safe load path exists for the Auxiliary Building Crane, we feel that it still would be possible to safely shut down both units in case of a load drop. Furthermore, with the improved crane operator training, crane maintenance and procedures now in place or coming into effect (see AEP:NRC:0514A, dated August 27, 1982; AEP:NRC:0514C, dated June 18, 1982; and AEP:NRC:0514E, dated September 29, 1982) the probability that a crane load drop would happen has been made very small.

AEP:NRC:0514F

APPENDIX B

CONTAINMENT POLAR CRANE

Instead of looking at individual loads and load paths, the worst load combination in terms of weight or size was allowed to drop anywhere within the crane travel (with one exception, noted below), in any orientation, and assumed that the load is stopped by the lowest level. The load used is a missile shield (29 ft. long x 10 ft. wide x 4 ft. deep, weight of 87 Tons). Based on the guidelines provided in NUREG-0612 Section 2.1-1, we have made the assumption that the load would penetrate to the lowest level, not taking into account the stopping power of the massive concrete structures, because we have not performed detailed structural analyses of the load drop. The discussion presented below is the result of this conservative assumption.

The only area excluded from the drop analysis was the reactor vessel, already discussed in Section 2.3 of AEP:NRC:0514A, dated August 27, 1982.

The criteria applicable to this analysis are to maintain cooling to the irradiated fuel in the reactor vessel and to assure that containment isolation capability is unimpaired. No other considerations are pertinent since the crane is only in use with the reactor shut down.

With respect to the first criterion it should always be possible to maintain cooling to the fuel, since a load drop would sever a maximum of two loops, under the conservative assumption stated below.

In severing any loop(s) the following sequence of events would happen:

1) Reactor coolant lines(s) is (are) severed.

2) Water starts draining from the refueling canal (if the canal had been filled) or the primary system through the broken legs.

3) Suction is lost from the RHR return line (if not severed in the load drop).

4) The containment recirculation sump starts to fill (load handling procedures plus the physical design of the steam generators enclosures make damage to the sump an incredible event).

5) RHR suction is taken from the containment sump.

6) RHR discharge to the intact loops is initiated.

Therefore, we feel that under any realistic set of assumptions, cooling to the irradiated fuel can be maintained even after a load drop takes place.

A load drop will not prevent the containment isolation system from operating on a high radiation signal, since the initiating signals and the sampling ports are outside the crane wall area.

Due to the compactness of the containment it is not possible to devise a load path that would prevent heavy loads from traveling over safety-related equipment. However, even with a load drop it is possible to maintain cooling to the irradiated fuel and maintain the capability of isolating the containment. Furthermore, with the crane operator training, crane maintenance and procedures now in place or coming into effect (See letters Nos. AEP:NRC:0514A, dated August 27, 1982; AEP:NRC:0514C, dated June 18, 1982; and AEP:NRC:0514E, dated September 29, 1982) the probability that a crane load drop would happen has been made very small.

AEP:NRC:0514F
APPENDIX C
ESSENTIAL SERVICE WATER SYSTEM

In evaluating load drops on the Essential Service Water System it is only necessary to consider the area between the Circulating Water Pump and Screen House and the Essential Service Water Piping Tunnel. It is not necessary to go beyond the tunnel, since from this point on, piping goes to individual systems and any load drop that would damage the ESW piping would probably also damage the system the piping is supplying water to.

Drawing 12-5166, attached, shows the routing of the ESW piping and cabling. For the most part, this piping and cabling is embedded in the foundation mat. However, in some places, while still embedded, there are open spaces (rooms and/or channels) below the embedment. Because of it, Drawing 12-5166 also shows those cranes and hoists whose operating area is above these open areas. The numbering of these areas correspond to the numbering given in Table A of this submittal and in Tables 1 and 2 of AEP:NRC:0514E, dated September 29, 1982.

Number 3 is the Circulating Water Pump and Screen House Crane. The supply piping and pumps are located inside the ESW pump room. This room is designed to take the impact of the crane with a 30T load, thus no damage is expected to this equipment (see AEP:NRC:0514E).

However, cabling used for the operation of the pumps extends outside the ESW pump room on the north, south and west sides. Since all cabling necessary for the emergency operation of the Unit 1 pumps is on the north side of the ESW pump room and all cabling necessary for emergency operation of the Unit 2 pumps is on the south side, no single load drop can disable all four pumps. Since there is a cross-tie header in the ESW piping tunnel, two operating ESW pumps are sufficient to supply the shutdown needs of both units. No cabling on the west side of the ESW pump room is needed for emergency operation.

The cables routed to the north and south ends of the Screen House (the routing goes into the hoisting area of the 1T and 5T Trash Basket Hoists - Numbers 28 and 39) provide power to the sluice gate motors. These sluice gates are opened in case the intake piping becomes blocked. One sluice gate is more than sufficient to supply water for the ESW pumps. Therefore, a load drop could not disable water supply to the ESW pump.

Number 12 corresponds to the Auxiliary Feedwater Pump Hoists. A load drop analysis was performed for the heaviest loads at the maximum possible height. The results show that neither the piping nor the cabling would be damaged.

Numbers 13 and 14 correspond to the Main and Auxiliary Turbine Building Cranes respectively. The areas shown are located over the intake channel for each Unit's condenser. The embedded cabling transversing these areas carries the ESW pump motor power for the respective Unit. Since only two of the four ESW pumps are needed, the loss of one set of power cables does not impair safe shutdown of either Unit.

The ESW discharge lines are 30 inches in diameter, and there is only one line per Unit. These lines, while embedded in the foundation mat, have in each unit an approximate 20 foot span over the intake channels. Since the mid-channel wall is under each line, each of these spans is actually two smaller spans of approximately 10 feet each. In order to make one of the ESW discharge lines inoperable, the line must become crimped and blocked. If it is only cracked, sufficient water can still flow through the line, and the ESW pumps would be operable.

If a heavy load was dropped in either of these areas it would have to break through the HP Turbine casing, and the HP Turbine reinforced concrete pedestal. It would then have to cause sufficient damage to the foundation mat so as to cause the line to crimp (the line is embedded beneath 3 ft of fill concrete and at least 4 ft of reinforced concrete). It is our judgement that most of the the dropped load's energy would be expended breaking through the HP Turbine casing and pedestal and that the foundation mat would at most crack. Therefore, the maximum damage that might happen, taking all the above into account, is the cracking of the line.

Numbers 41 and 43 are the Moisture Separator Reheater Hoists and Number 42 is the Transformer, Battery Pack and U.P.S. Hoist. The effects of loads dropped from these hoists are enveloped by load drop analyses done on other hoists (see Appendix D). The result of this evaluation is that no damage is expected due to load drops from these hoists.

In conclusion, although parts of the Essential Service Water System might become damaged in a load drop, a sufficient portion of the system would remain operable to safely shutdown both units.

APPENDIX D
MAINTENANCE CRANES AND HOISTS

The maintenance cranes and hoists (Numbers 4 through 12 on Table A) are dedicated for maintenance work on one or two components. Therefore, in general, a load drop from one of these cranes or hoists will only damage the piece of equipment being worked on. Since the damaged piece of equipment is already out of service, the status of the system remains unchanged (see our discussion in AEP:NRC:0514E, dated September 29, 1982).

Numbers 4, 8, 9, and 11 (the Diesel Generator Crane, the Containment Spray Pump Hoist, the Residual Heat Removal Pump Hoist, and the Recirculation Valve Hoist, respectively) are on the respective lowest elevation of the plant. Therefore, a load drop cannot damage any other equipment.

Numbers 5, 6, 7, and 12 (the Reciprocating Charging Pump Hoist, the Centrifugal Charging Pump Hoist, the Safety Injection Pump Hoist, and the Auxiliary Feedwater Pump Hoist, respectively) were analyzed for load drops. The analyses were performed for the heaviest loads at the maximum heights. The results show that the floors would absorb the effects of the load drop. Therefore, no other equipment will be damaged.

Number 10 (the Main Steam Valve Hoist) is used only during reactor shutdown. A load drop from this hoist could only damage the Main Steam and Feedwater Piping underneath it. Since the reactor is already shutdown, this piping is not needed.

In conclusion, a load drop from any of the cranes and hoists listed here will not change the safety status of the plant.

TABLE 2.1.3.C.1

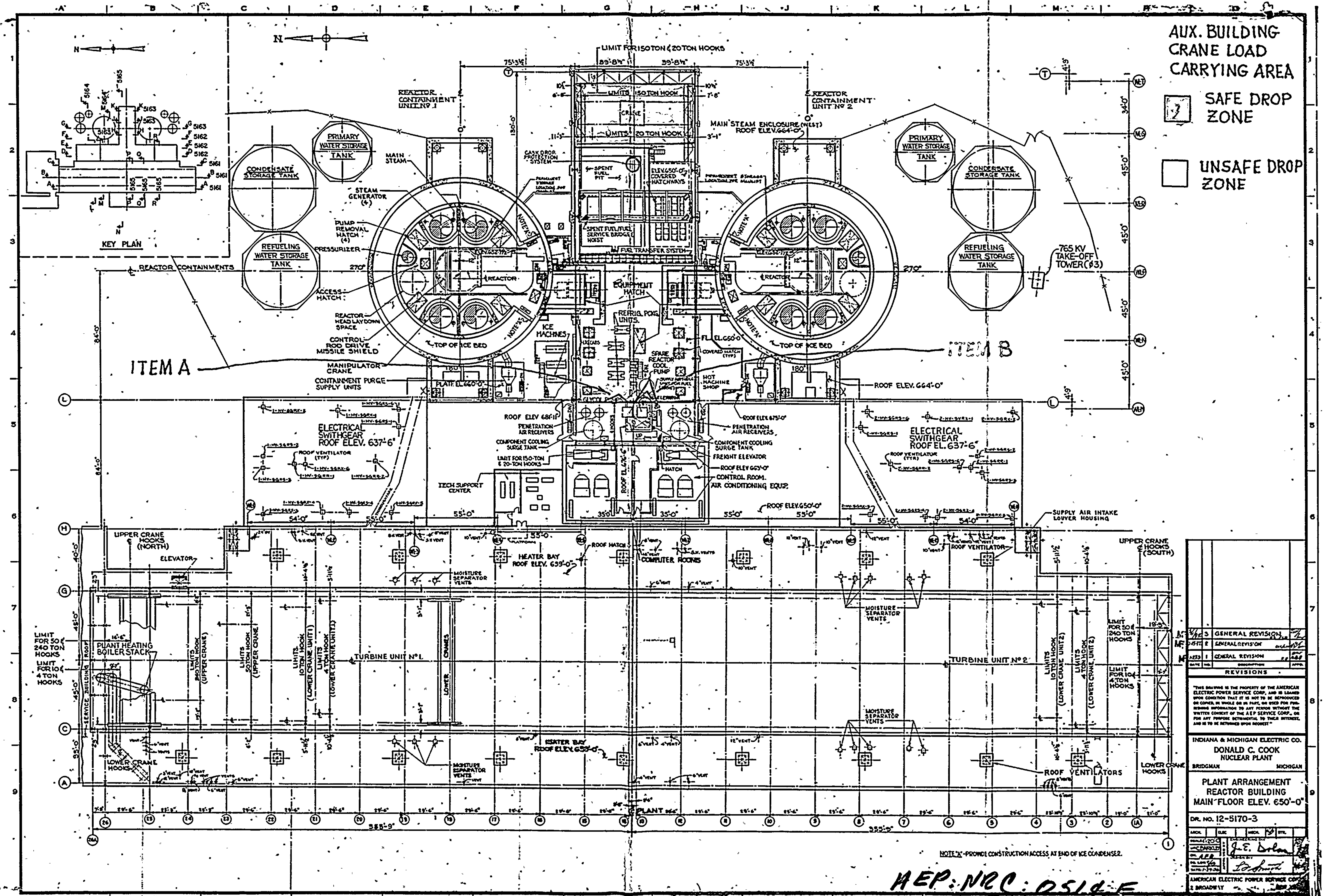
SURVEY OF HEAVY LOADS*

AEP:NCR:0514C

AREA	CRANE A = Aux. Bldg. Crane FHC = New & Spent Fuel Handling Crane		Loads Handled	Over (O) or only Proximity (P) to Spent Fuel	Approximate Weight	Frequency Handled	Lifting Device	Handling Procedure
Auxiliary Building	A	1.	Spent Fuel Shipping Cask	(P)	110 Tons	(Future)	(Future)	(Future)
	A	2.	Radiation Protection Shields	(P)	55 Tons	As required during refueling outages	SLINGS	12 MHP 5021.001.036
	A	3.	Irradiated Specimen Shipping Cask	(P)	1-2 Tons	8 times in 20 yrs.(2 Units)	Slings	12 MHP-SP-006
	A	4.	Plant Equipment (e.g. pumps, motors, valves, heat exchangers)	(P)	Max 4 Tons	As required for modification or replacement	Slings	12 MHP 5021.001.036
	A	5.	New Fuel Shipping Containers with Assembly	(P)	1-1/2 Tons	50/year	Slings	12 MHP 4050 FDF .001 12 MHP 4050 FDF .002
	FHC	6.	Spent Fuel Assembly	(O)	1850#/1890#**	100-150 per refueling	Handling Tool	12 MHP 4050 FDF .008
	A	7.	Crane Load Block	(P)	4.25 T	Integral to Crane	Crane Ropes	12 MHP 4050 FDF .011
	A & FHC	8.	New Fuel Assembly	(P)	1850#/1890#**	100-150 per refueling	Handling Tool	12 MHP 4050 FDF .003
	A	9	Superstructure New & Spent Fuel Handling Crane	(P)	25 Tons	Approx. every 18 months	Slings	Instruction Book #10 Dwight Foote, Inc.
	A	10.	Equipment Hatch	(P)	45 Tons	As required during refueling	Slings	12 MHP 5021.001.032
	A	11.	Reactor Coolant Pump Rotating Assembly	(P)	28 Tons	As required during maintenance	Slings	12 MHP 5021.001.036
	A	12.	Reactor Coolant Pump Motor	(P)	38 Tons	As required during maintenance	Slings	12 MHP 5021.001.036
	A	13.	LSA Waste Boxes	(P)	2 Tons	52/year	Slings	12 MHP 5021.001.036
	A	14.	Waste Container Metal Bin	(P)	2 Tons	52/year	Slings	12 MHP 5021.001.036
	A	15.	Glycol Tank	(P)	5 Tons	12/year	Slings	12 MHP 5021.001.036
	A	16.	Reactor Stud Rack (12 Studs/rack)	(P)	4-5 Tons	4/year	Slings	12 MHP 5021.001.036

* Heavy Loads are defined as "any load, carried in a given area after a plant becomes operational, that weighs more than the combined weight of a single spent fuel assembly and its associated handling tool for the specific plant in question."

** Unit No. 1 1850#, Unit No. 2 1890#



AUX. BUILDING CRANE LOAD CARRYING AREA
SAFE DROP ZONE
UNSAFE DROP ZONE
KEY PLAN
LIMIT FOR 150 TON & 20 TON HOOKS
LIMITS 150 TON HOOK
LIMITS 20 TON HOOK
REACTOR CONTAINMENT UNIT NO 1
REACTOR CONTAINMENT UNIT NO 2
MAIN STEAM ENCLOSURE (WEST) ROOF ELEV. 664'-0"
CASK DROP PROTECTION SYSTEM
SPENT FUEL PIT
ELEV. 650'-0" COVERED HATCHWAYS
SPENT FUEL/FUEL SERVICE BRIDGE HOIST
FUEL TRANSFER SYSTEM
PRIMARY WATER STORAGE TANK
CONDENSATE STORAGE TANK
REFUELING WATER STORAGE TANK
MAIN STEAM
STEAM GENERATOR (4)
PUMP REMOVAL HATCH (4)
PRESSURIZER
REACTOR
ACCESS HATCH
REACTOR HEAD LAYDOWN SPACE
CONTROL ROD DRIVE MISSILE SHIELD
TOP OF ICE BED
MANIPULATOR CRANE
CONTAINMENT PURGE SUPPLY UNITS
REACTOR CONTAINMENTS
EQUIPMENT HATCH
ICE MACHINES
REFRIG. PCKG UNITS
SPARE REACTOR COOL PUMP
HOT MACHINE SHOP
765 KV TAKE-OFF TOWER (Ø3)
ITEM A
ITEM B
ROOF ELEV. 664'-0"
ELECTRICAL SWITHGEAR ROOF ELEV. 637'-6"
ROOF ELEV. 681'-1"
PENETRATION AIR RECEIVERS
COMPONENT COOLING SURGE TANK
LIMIT FOR 150-TON & 20-TON HOOKS
FREIGHT ELEVATOR
ROOF ELEV 663'-0"
CONTROL ROOM AIR CONDITIONING EQUIP.
TECH SUPPORT CENTER
ROOF ELEV. 650'-0"
SUPPLY AIR INTAKE LOUVER HOUSING
UPPER CRANE HOOKS (NORTH)
UPPER CRANE HOOKS (SOUTH)
ELEVATOR
HEATER BAY ROOF ELEV. 659'-0"
ROOF HATCH
COMPUTER ROOMS
MOISTURE SEPARATOR VENTS
ROOF VENTILATOR
LIMIT FOR 50 & 240 TON HOOKS
LIMIT FOR 10 & 4 TON HOOKS
PLANT HEATING BOILER STACK
SERVICE BUILDING ROOF
TURBINE UNIT NO 1
TURBINE UNIT NO 2
LOWER CRANES
LOWER CRANE HOOKS
ROOF VENTILATORS
PLANT
355'-9"
NOTE "A" - PROVIDE CONSTRUCTION ACCESS AT END OF ICE CONDENSER.
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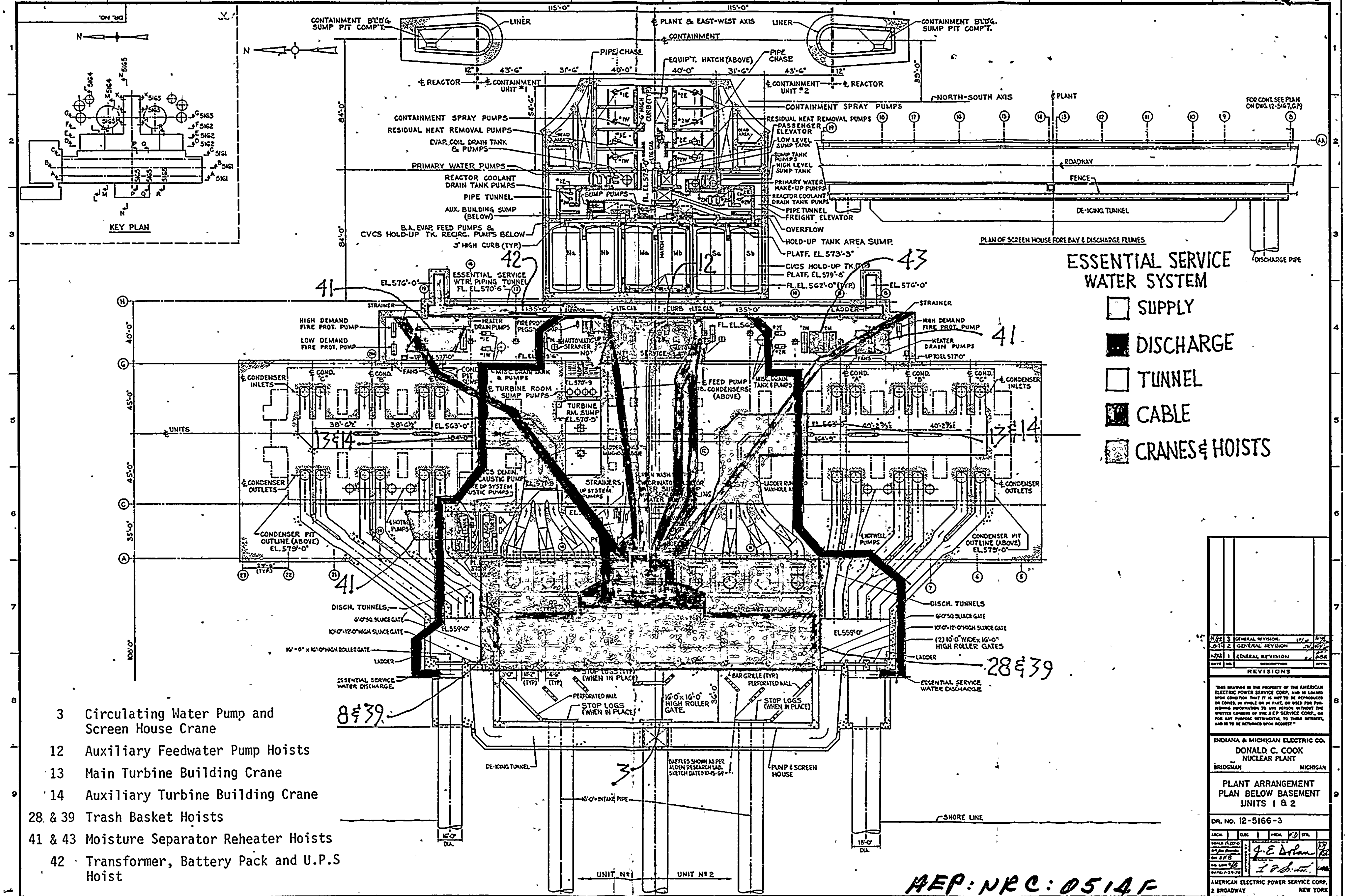
PLANT ARRANGEMENT REACTOR BUILDING MAIN FLOOR ELEV. 650'-0"
DR. NO. 12-5170-3
AMERICAN ELECTRIC POWER SERVICE CORP.
2 BROADWAY
AEP:NRC:0514E

SHEET A -

- SHEET B

[illegible]



3 Circulating Water Pump and Screen House Crane
12 Auxiliary Feedwater Pump Hoists
13 Main Turbine Building Crane
14 Auxiliary Turbine Building Crane
28 & 39 Trash Basket Hoists
41 & 43 Moisture Separator Reheater Hoists
42 Transformer, Battery Pack and U.P.S Hoist