Lefave

EGG-HS-6261

CONTROL OF HEAVY LOADS AT NUCLEAR POWER PLANTS
SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 1
(PHASE I)

Docket No. 50-387

Author

T. H. Stickley

Principal Technical Investigator

T. H. Stickley

Published April 1983

EG&G Idaho, Inc.
Idaho Falls, Idaho 83415

Prepared for the
U.S. Nuclear Regulatory Commission
Under DOE Contract No. DE-AC07-76ID01570
FIN No. A6457

ABSTRACT

The Nuclear Regulatory Commission (NRC) has requested that all nuclear plants, either operating or under construction, submit a response of compliancy with NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants." EG&G Idaho, Inc., has contracted with the NRC to evaluate the responses of those plants presently under construction. Utilities are required to report in two phases. This report contains EG&G's evaluation and recommendations for Susquehanna Steam Electric Station Unit No. 1 (SSES No. 1). Only Phase I is addressed. Phase II will be covered in a separate report.

EXECUTIVE SUMMARY

Based upon the information provided, EG&G Idaho concludes that Susquehanna Steam Electric Station, Unit 1 is in compliance with the intent of the requirements of NUREG 0612.

CONTENTS

TABLES

CONTROL OF HEAVY LOADS AT NUCLEAR POWER PLANTS
SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 1
(PHASE I)

1. INTRODUCTION

1.1 Purpose of Review

This technical evaluation report documents the EG&G Idaho Inc. review of general load-handling policy and procedures at Susquehanna Steam Electric Station Unit 1. This evaluation was performed with the objective of assessing conformance to the general load-handling guidelines of NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants" [1], Section 5.1.1.

1.2 Generic Background

Generic Technical Activity Task A-36 was established by the U.S. Nuclear Regulatory Commission (NRC) staff to systematically examine staff licensing criteria and the adequacy of measures in effect at operating nuclear power plants to assure the safe handling of heavy loads and to recommend necessary changes to these measures. This activity was initiated by a letter issued by the NRC staff on May 17, 1978 [2], to all power reactor applicants, requesting information concerning the control of heavy loads near spent fuel.

The results of Task A-36 were reported in NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants." The staff's conclusion from this evaluation was that existing measures to control the handling of heavy loads at operating plants, although providing protection from certain potential problems, do not adequately cover the major causes of load-handling accidents and should be upgraded.

In order to upgrade measures for the control of heavy loads, the staff developed a series of guidelines designed to achieve a two-phase objective using an accepted approach or protection philosophy. The

first portion of the objective, achieved through a set of general guidelines identified in NUREG-0612, Article 5.1.1, is to ensure that all load-handling systems at nuclear power plants are designed and operated such that their probability of failure is uniformly small and appropriate for the critical tasks in which they are employed. The second portion of the staff's objective, achieved through guidelines identified in NUREG-0612, Articles 5.1.2 through 5.1.5 is to ensure that, for load-handling systems in areas where their failure might result in significant consequences, either (a) features are provided, in addition to those required for all load-handling systems, to ensure that the potential for a load drop is extremely small (e.g., a single-failure-proof crane) or (b) conservative evaluations of load-handling accidents indicate that the potential consequences of any load drop are acceptably small. Acceptability of accident consequences is quantified in NUREG-0612 into four accident analysis evaluation criteria.

The approach used to develop the staff guidelines for minimizing the potential for a load drop was based on defense in depth and is summarized as follows:

- Provide sufficient operator training, handling system design, load-handling instructions, and equipment inspection to assure reliable operation of the handling system

- Define safe load travel paths through procedures and operator training so that, to the extent practical, heavy loads are not carried over or near irradiated fuel or safe shutdown equipment

- Provide mechanical stops or electrical interlocks to prevent movement of heavy loads over irradiated fuel or in proximity to equipment associated with redundant shutdown paths.

Staff guidelines resulting from the foregoing are tabulated in Section 5 of NUREG-0612.

1.3 Plant-Specific Background

On December 22, 1980, the NRC issued a letter [3] to the Pennsylvania Power and Light Co. (PP&L), the Applicant for SSES No. 1, requesting that the Applicant review provisions for handling and control of heavy loads at SSES No. 1, evaluate these provisions with respect to the guidelines of NUREG-0612, and provide certain additional information to be used for an independent determination of conformance to these guidelines. On June 22, 1981, PP&L provided the initial response [4] to this request.

On September 24, 1981, PP&L submitted a final response [4a] to the generic letter. PP&L submitted another report [4b] on June 4, 1982. A telephone conference among PP&L, NRC, and EG&G Idaho was held on June 23, 1982. A response to the telephone call [4c] was submitted by PP&L on November 18, 1982.

2. EVALUATION AND RECOMMENDATIONS

2.1 Overview

The following sections summarize PP&L's review of heavy load-handling at SSES No. 1 accompanied by EG&G's evaluation, conclusions, and recommendations to the Applicant for bringing the facilities more completely into compliance with the intent of NUREG-0612. The Applicant has indicated the weight of a heavy load for this facility (as defined in NUREG-0612, Article 1.2) as over 1000 pounds.

2.2 Heavy Load Overhead Handling Systems

This section reviews the Applicant's list of overhead handling systems which are subject to the criteria of NUREG-0612 and a review of the justification for excluding overhead handling systems from the above-mentioned list.

2.2.1 Scope

"Report the results of your review of plant arrangements to identify all overhead handling systems from which a load drop may result in damage to any system required for plant shutdown or decay heat removal (taking no credit for any interlocks, technical specifications, operating procedures, or detailed structural analysis) and justify the exclusion of any overhead handling system from your list by verifying that there is sufficient physical separation from any load-impact point and any safety-related component to permit a determination by inspection that no heavy load drop can result in damage to any system or component required for plant shutdown or decay heat removal."

A. Summary of Applicant Statements

The introduction to PP&L's submittal contained this statement.

"PP&L's basic objective in responding to NUREG-0612 is to insure that the handling of the overhead loads at

SSES is performed in a safe and efficient manner by providing operators with the proper training, operating procedures, and the equipment safeguards necessary, and by insuring that as many overhead operations as possible are performed along defined safe load paths. Where loads must be handled in the vicinity of new or spent-fuel, or nuclear safety related equipment, the ultimate objectives are to insure:

1. radioactive release as a result of a potential load drop is within the requirements of 10 CFR Part 100,

2. damage to fuel will not result in a k_{eff} greater than 0.95.

3. damage to the RPV or spent-fuel pool will not uncover fuel, and

4. damage to equipment will not result in the loss of safe shut down capability nor the capability to remove decay heat.

For the purposes of this response, a heavy load was considered to be any load in excess of one thousand pounds. This was the most realistic weight limit to evaluate because many cranes, monorails and hoists were rated in units of 1/4, 1/2, or 1 ton units. In addition, the weight of some loads was estimated and a convenient unit (1/2 ton) was conservatively used for relatively small loads."

PP&L's review of load-handling equipment and assessment of those cranes which could be excluded from further load drop analysis was conducted by a walkthrough of the plant, drawing reviews (drawings supplied), and a cross check with the SSES Equipment Index. Consideration was also given to the lateral movement of loads due to deflections, caused by the possibility of loads striking structural members.

Where cranes or monorails travel over hatches or access ways, the lower areas were also visually inspected for the potential impact of a load drop.

Table 1, Part B of the submittal calls out, by equipment number, those pieces of equipment which fall into PP&L's category indicated by Note (3):

> "Note (3) Handling this load requires further review to determine whether modifications or procedural requirements are to be implemented to meet NUREG 0612. Results of the review will be in PP&L's final report."

Attachment A, intended to supplement Table 1, Part B, explains the nature of the handling problems and indicates "either-or" solutions.

In reference [4c] PP&L states:

> "PP&L did not rely on off-site calculations to justify postulated load drops. For this reason, our analyses are valid regardless of the allowable dose rate used; however, if this type of analysis is done in the future, the criterion of 'less than 25 per cent of the requirements of 10 CFR 100' will be used."

B. EG&G Evaluation

PP&L's evaluation is thorough and appears to address all important points. The techniques used are good.

PP&L has defined a heavy load as any load in excess of 1000 lb. EG&G assumes that this meets the NUREG 0612 definition, "any load, carried in a given area after a plant becomes operational, that weighs more than the combined weight of single spent-fuel assembly and its associated handling tool for the specific plant in question."

C. EG&G Conclusions and Recommendations

Based upon the information provided, EG&G Idaho concludes that PP&L is in compliance with the requirements of 2.2.1, above, at SSES No. 1.

2.3 General Guidelines

This section addresses the extent to which the applicable handling systems comply with the general guidelines of NUREG-0612 Article 5.1.1. EG&G's conclusions and recommendations are provided in summaries for each guideline.

The NRC has established seven general guidelines which must be met in order to provide the defense-in-depth approach for the handling of heavy loads. These guidelines consist of the following criteria from Section 5.1.1 of NUREG-0612:

- Guideline 1--Safe Load Paths
- Guideline 2--Load-Handling Procedures
- Guideline 3--Crane Operator Training
- Guideline 4--Special Lifting Devices
- Guideline 5--Lifting Devices (not specially designed)
- Guideline 6--Cranes (Inspection, Testing, and Maintenance)
- Guideline 7--Crane Design.

These seven guidelines should be satisfied for all overhead handling systems and programs in order to handle heavy loads in the vicinity of the reactor vessel, near spent-fuel in the spent-fuel pool, or in other areas where a load drop may damage safe shutdown systems. The succeeding paragraphs address the guidelines individually.

2.3.1 Safe Load Paths [Guideline 1, NUREG-0612, Article 5.1.1(1)]

"Safe load paths should be defined for the movement of heavy loads to minimize the potential for heavy loads, if dropped, to impact irradiated fuel in the reactor vessel and in the spent-fuel pool, or to impact safe shutdown equipment. The path should follow, to the extent practical, structural floor members, beams, etc., such that if the load is dropped, the structure is more likely to withstand the impact. These load paths should be defined in procedures, shown on equipment layout drawings, and clearly marked on the floor in the area where the load is to be handled. Deviations from defined load paths should require written alternative procedures approved by the plant safety review committee."

A. Summary of Applicant Statements

"Plant Staff engineers have reviewed the load-handling systems for the purpose of identifying safe load paths relative to safety equipment and spent-fuel. Figures 1 thru 26 were marked to indicate the safety related equipment, spent-fuel and the paths chosen. Also included in the figures are structural steel prints used to determine the most feasible safe load paths. These paths were defined for handling systems that both fell under the area of concern with respect to NUREG-0612, and were of the bridge crane type. Monorails were excluded from this analysis, since load movement is dedicated by the monorail itself. Safe load paths will be clearly marked on the floor of the plant by the constructor. PP&L's Mechanical Maintenance is committed to incorporate the safe load paths into the appropriate operating procedures."

The November 18, 1982, submittal [4c] addresses the marking of safe load paths and the method of obtaining approval for deviations from safe load paths.

B. EG&G Evaluation

EG&G's review of the Applicant response, and drawings submitted, indicates that SSES No. 1 may be considered to be in compliance with Guideline 1.

PP&L's review seems to be comprehensive and the response indicates an understanding of the points covered by Guideline 1 of NUREG 0612. PP&L adequately addresses the marking of safe load paths and the method of obtaining approval for deviation from safe load paths.

C. EG&G Conclusions and Recommendations

Based upon the information provided, EG&G Idaho concludes that SSES No. 1 is in compliance with the intent of Guideline 1 of NUREG 0612.

2.3.2 Load-Handling Procedures [Guideline 2, NUREG-0612, Article 5.1.1(2)]

"Procedures should be developed to cover load-handling operations for heavy loads that are or could be handled over or in proximity to irradiated fuel or safe shutdown equipment. As a minimum, procedures should cover handling of those loads listed in Table 3.1-1 of NUREG-0612. These procedures should include: identification of required equipment; inspections and acceptance criteria required before movement of load; the steps and proper sequence to be followed in handling the load; defining the safe path; and other special precautions."

A. Summary of Applicant Statements

"PP&L is currently preparing general operating procedures for overhead handling systems. These procedures will include precautions and guidelines to be observed while operating the systems. A general operating procedure for the Unit 1 Reactor Building Crane is currently being prepared by PP&L and will be available for use prior to fuel load date (approximate implementation date is July 1981). A draft copy is attached for information purposes (see Attachment B, "Reactor Building Crane Operating Procedure"). The draft copy indicates how compliance with NUREG-0612 will be accomplished; it describes in detail the operational procedure the precautions to be taken to insure safe handling of loads. In addition to crane operating procedures, PP&L is developing special handling procedures for major heavy loads. Such procedures will supplement the general crane operating procedure by providing additional precautions and a safe load path for that unique load.

A draft copy of the procedure "Reactor Pressure Vessel Head Installation and Removal" is attached for information purposes (see Attachment C). Now that the handling systems that could impact safe shutdown equipment have been identified, PP&L will develop procedures governing movements within these areas. All specific fuel handling processes and load movements on the Refueling Floor will be covered by addending a special load-handling procedure for that particular evaluation, to the general operating procedure for the crane to be used."

B. EG&G Evaluation

Insofar as EG&G can determine, the sample procedures submitted by PP&L are well done. In Reference [4c], PP&L states that generic safe load paths have been incorporated into crane operating procedures. In support of this, PP&L has submitted a chart comparing their actions with the requirements of Table 3.1-1 of NUREG 0612.

PP&L has developed crane operating procedures (not submitted) and special heavy-load-handling procedures (MT-99-001, Rev. 0 was submitted as a sample). The concept is acceptable and the procedure submitted seemed to be thorough.

The submittal adequately addresses the requirements of Guideline 2 of NUREG 0612.

C. EG&G Conclusions and Recommendations

Based on the information provided, EG&G Idaho concludes that SSES No. 1 is in compliance with the intent of Guideline 2 of NUREG 0612.

2.3.3 Crane Operator Training [Guideline 3, NUREG-0612, Article 5.1.1(3)]

"Crane operators should be trained, qualified, and conduct themselves in accordance with Chapter 2-3 of ANSI B30.2-1976, 'Overhead and Gantry Cranes' [5]."

A. Summary of Applicant Statements

"We made no exceptions to ANSI B30.2-1976. The crane operator's training program was developed to meet the requirements of chapter 2.3 of ANSI B30.2-1976 "Overhead and Gantry Cranes." A procedure is currently being written by plant staff mechanical section to formalize the program and furnish the necessary forms to document the training. All crane operators will be qualified to this procedure."

B. EG&G Evaluation

Based upon the Applicant's statement, the crane operator training program satisfies the criteria of Guideline 3.

EG&G Idaho assumes that the "crane operator's training program" mentioned in 2.3.3 A is the same as "AD-00-015, Crane Operator Qualification Program," referenced in 3.1 of MT-99-001.

C. EG&G Conclusion and Recommendations

Based on the information provided, EG&G Idaho concludes that SSES No. 1 is in compliance with the intent of Guideline 3 of NUREG 0612.

2.3.4 Special Lifting Devices [Guideline 4, NUREG-0612, Article 5.1.1(4)]

"Special lifting devices should satisfy the guidelines of ANSI N14.6-1978, 'Standard for Special Lifting Devices for Shipping Containers Weighing 10,000 Pounds (4500 kg) or More for Nuclear Materials' [6]. This standard should apply to all special lifting devices which carry heavy loads in areas as defined above. For operating plants, certain inspections and load tests may be accepted in lieu of certain material requirements in the standard. In addition, the stress design factor stated in Section 3.2.1.1 of ANSI N14.6 should be based on the combined maximum static and dynamic loads that could be imparted on the handling device based on characteristics of the crane which will be used. This is in lieu of the guideline in Section 3.2.1.1 of ANSI N14.6 which bases the stress design factor on only the weight (static load) or the load and of the intervening components of the special handling device."

A. Summary of Applicant Statements

"Slings and special lifting devices have not been procured for use at SSES except the strongback used for the RPV head and the lifting device for the dryer and separator. These items have been designed and supplied by the NSSS vendor. Sufficient information is not yet available for determining full compliance with ANSI B30.9 1971; however, the strongback for the RPV has been proof-load tested to 125 tons, inspected by magnetic particle examination and used to move the RPV head for Unit 1, and the dryer/separator lifting device meets the proof-load requirements of ANSI B30.9-1971 and has been inspected by magnetic particle examination. All other slings and/or lifting devices which will handle heavy loads that could impact safety-related equipment or fuel will be installed and used in accordance with the guidelines of ANSI B30.9-1971. In selecting the proper sling, the load used will be the sum of the static and the maximum dynamic load (SSE will not be included in the dynamic load imposed in the sling or lifting device). The rating identification on the sling will be in terms of the "static load" which produces the maximum static and dynamic load. Where this restricts slings to use on only certain cranes, the slings will be marked as to the cranes with which they may be used. Special lifting devices to be used with spent-fuel shipping containers will be designed, installed and used in accordance with the guidelines of ANSI N14.6-1978."

Additional information supplied in subsequent submittals [4a], [4b], and [4c], by means of a point-by-point comparison with ANSI N14.6-1978, addresses compliance with Guideline 4 of NUREG 0612.

B. EG&G Evaluation

Information contained in references [4], [4a], [4b], and [4c] is sufficient to make an assessment of compliance with Guideline 4 of NUREG 0612. Where PP&L has tested to 125% of the rating, instead of the 150% stated in ANSI N14.6-1978, EG&G Idaho considers this to be in compliance with the intent of Guideline 4.

PP&L has stated, "Special lifting devices to be used with spent-fuel shipping containers will be designed, installed and used in accordance with the guidelines of ANSI N14.6 1978." Guideline 4 states "This standard should apply to all special lifting devices which carry heavy loads in areas as defined above." This guideline also states that the stress design factor in Section 3.2.1.1 of ANSI N14.6 should be based on the combined maximum static and dynamic loads that could be imparted on the handling device based on characteristics of the crane which will be used.

C. EG&G Conclusions and Recommendations

Based on the information provided, EG&G Idaho concludes that SSES No. 1 is in compliance with the intent of Guideline 4 of NUREG 0612.

2.3.5 Lifting Devices (Not Specially Designed) [Guideline 5, NUREG-0612, Article 5.1.1(5)]

"Lifting devices that are not specially designed should be installed and used in accordance with the guidelines of ANSI B30.9-1971, 'Slings' [7]. However, in selecting the proper sling, the load used should be the sum of the static and maximum dynamic load. The rating identified on the sling should be in terms of the 'static load' which produces the maximum static and dynamic load. Where this restricts slings to use on only certain cranes, the slings should be clearly marked as to the cranes with which they may be used."

A. Summary of Applicant Statements

"All other slings (not covered in 2.3.4) and/or lifting devices which will handle heavy loads that could impact safety-related equipment or fuel will be installed and used in accordance with the guidelines of ANSI B30.9-1971. In selecting the proper sling, the load used will be the sum of the static and the maximum dynamic load imposed in the sling

or lifting device). The rating identification on the sling will be in terms of the "static load" which produces the maximum static and dynamic load. Where this restricts slings to use on only certain cranes, the slings will be marked as to the cranes with which they may be used."

PP&L also addressed the use of slings in References [4a], [4b], and [4c].

B. EG&G Evaluation

The information supplied in References [4], [4a], [4b], and [4c] is sufficient to make an evaluation of compliance with Guideline 5 of NUREG 0612. PP&L indicates that slings for general purpose rigging will be sized for a minimum of 15% dynamic loading.

C. EG&G Conclusions and Recommendations

Based on the information provided, EG&G Idaho concludes that SSES No. 1 is in compliance with the intent of Guideline 5 of NUREG 0612.

2.3.6 Cranes (Inspection, Testing, and Maintenance) [Guideline 6, NUREG-0612, Article 5.1.1(6)]

"The crane should be inspected, tested, and maintained in accordance with Chapter 2-2 of ANSI B30.2-1976, 'Overhead and Gantry Cranes,' with the exception that tests and inspections should be performed prior to use where it is not practical to meet the frequencies of ANSI B30.2 for periodic inspection and test, or where frequency of crane use is less than the specified inspection and test frequency (e.g., the polar crane inside a PWR containment may only be used every 12 to 18 months during refueling operations, and is generally not accessible during power operation. ANSI B30.2, however, calls for certain inspections to be performed daily or monthly. For such cranes having limited usage, the inspections, test, and maintenance should be performed prior to their use)."

A. Summary of Applicant Statements

"PP&L is presently developing a preventative maintenance program to include all cranes and hoists. This program will include requirements for inspection, testing, and maintenance in accordance with the guidelines of Chapter 2-2 of ANSI B30.2-1976 with the exception that tests and inspections will be performed prior to use where it is not practical to meet the frequencies of ANSI B30.2 for periodic inspection and test, or where frequency of crane use is less than the specified inspection and test frequency. The diesel building cranes (OH501 A, B, C, and D) and the reactor building crane (auxiliary hoist, 1H213) have been used during plant construction. The construction group has performed the necessary inspecting, testing, and maintenance requirements of Chapter 2-2, ANSI B30.2-1967."

B. EG&G Evaluation

The projected preventive maintenance program in accordance with ANSI B30.2.0 1976 is acceptable for cranes in this classification. Technically, monorail systems and underhung cranes should be inspected, tested, and maintained in accordance with ANSI B30.11-1980. In these instances, the requirements are not significantly different so that ANSI B30.2.0-1976 is acceptable.

PP&L states that those cranes used during construction were inspected, tested, and maintained, by the construction organization in accordance with ANSI B30.2.0-1976.

C. EG&G Conclusions and Recommendations

Based on the information provided, EG&G Idaho concludes that SSES No. 1 is in compliance with the intent of Guideline 6 of NUREG 0612.

2.3.7 Crane Design [Guideline 7, NUREG-0612, Article 5.1.1(7)]

"The crane should be designed to meet the applicable criteria and guidelines of Chapter 2-1 of ANSI B30.2-1976, 'Overhead and Gantry

Cranes,' and of CMAA-70, 'Specifications for Electric Overhead Traveling Cranes' [3]. An alternative to a specification in ANSI B30.2 or CMAA-70 may be accepted in lieu of specific compliance if the intent of the specification is satisfied."

A. Summary of Applicant Statements

Design requirements, for those cranes from which a load drop could impact safety-related equipment or fuel, are in accordance with the Crane Manufacturers Association of America (CMAA) Specification 70 and ANSI B30.2. The reactor building crane (1H213) and the diesel building cranes (0H501 A, B, C, and D) are designed in accordance with CMAA-70, Class C and ANSI B30.2-1967. The monorail hoists are designed in accordance with ANSI B30.16. The design of the jib crane is in accordance with ANSI B30.2-1976 and CMAA-70.

B. EG&G Evaluation

The Applicant states that monorail hoists are designed in accordance with ANSI B30.16. Guideline 7 states that an alternative to a specification in ANSI B30.2 or CMAA 70 may be accepted in lieu of specific compliance if the intent of the specification is satisfied. EG&G feels that, for this type of equipment, ANSI B30.16 is an acceptable equivalent to ANSI B30.2.

C. EG&G Conclusions and Recommendations

Based on the information provided, EG&G Idaho concludes that SSES No. 1 is in compliance with the intent of Guideline 7 of NUREG 0612.

3. CONCLUDING SUMMARY

3.1 Applicable Load-Handling Systems

The list of cranes and hoists provided by S&L as being subject to the provisions of NUREG 0612 is adequate.

3.2 Guideline Recommendations

The requirements of the seven NRC guidelines for heavy load-handling (Section 2.3) are satisfied at SSES No. 1. This conclusion is represented in tabular form as Table 3.1.

Guideline	Recommendation
1. (Section 2.3.1)	Complies with Guideline 1
2. (Section 2.3.2)	Complies with Guideline 2
3. (Section 2.3.3)	Complies with Guideline 3
4. (Section 2.3.4)	Complies with Guideline 4
5. (Section 2.3.5)	Complies with Guideline 5
6. (Section 2.3.6)	Complies with Guideline 6
7. (Section 2.3.7)	Complies with Guideline 7

TABLE 3.1. SUSQUEHANNA STEAM ELECTRIC STATION No.1, NUREG 0612 COMPLIANCE MATRIX

Equipment Designation	Heavy Loads	Weight or Capacity (tons)	Guideline 1 Safe Load Paths	Guideline 2 Procedures	Guideline 3 Crane Operator Training	Guideline 4 Special Lifting Devices	Guideline 5 Slings	Guideline 6 Crane-Test and Inspection	Guideline 7 Crane Design
OH [illegible] A, B, C, D Diesel Generator Building	Stator 24,200 lb Rotor 27,114 lb	20	C	C	C	C	C	C	C
IH 210 Reactor Building	24,715 lb 7,115 6,330 1,379 2,700	Not supplied must be 12.5	C	C	C	C	C	C	C
IH 201 Refueling IH 203 Platform IC 214	Listed only as "fuel"	Not supplied	C	C	C	C	C	C	C
IH 211 Reactor Building	Fuel bundle 800 lb	Not supplied	C	C	C	C	C	C	C
IH 213 Reactor Building	Nuclear fuel	5							
(Auxiliary Hook)	Fuel pool covers Weight not supplied		C	C	C	C	C	C	C
(Main Hoist)	Missle/shield blocks 197,000 lb maximum	125	C	C	C	C	C	C	C

TABLE 3.1. (Continued)

Equipment Designation	Heavy Loads	Weight or Capacity (tons)	Guideline 1 Safe Load Paths	Guideline 2 Procedures	Guideline 3 Crane Operator Training	Guideline 4 Special Lifting Devices	Guideline 5 Slings	Guideline 6 Crane-Test and Inspection	Guideline 7 Crane Design
Reactor Building XHXXX crane not yet purchased	Resin bed shield covers 30,500 lbs		C	C	C	C	C	C	C
IH 219 Reactor Building	Equipment access door	Not supplied	C	C	C	C	C	C	C
IH 403, IH 401, IH 406, IH 407, IH 408, XHXXX Reactor Building	Safety valve 2800 lbs	Not supplied	C	C	C	C	C	C	C
IH 205 Reactor Building	Recirculation pump 27,200 lbs	24	C	C	C	C	C	C	C
IH 209 Reactor Building	Reactor heat removal pump 20,650 lbs (maximum)	Not supplied	C	C	C	C	C	C	C

C = Applicant action complies with NUREG-0612 Guideline.
NC = Applicant action does not comply with NUREG-0612 Guideline
R = Applicant has proposed revisions/modifications designed to comply with NUREG-0612 Guideline.
I = Insufficient information provided by the Applicant.

3.3 Interim Protection

EG&G's evaluation of information provided by the Applicant indicates that the following actions are necessary to ensure that the six NRC staff measures for interim protection at SSES No. 1 are met:

Interim Measure	Recommendation
Interim Measures were not addressed	Not Applicable.

4. REFERENCES

1. NUREG-0612, Control of Heavy Loads at Nuclear Power Plants, NRC.

2. V. Stello, Jr. (NRC), Letter to all applicants. Subject: Request for Additional Information on Control of Heavy Loads Near Spent Fuel, NRC, 17 May 1978.

3. USNRC, Letter to Pennsylvania Power & Light. Subject: NRC Request for Additional Information on Control of Heavy Loads Near Spent Fuel, NRC, 22 December 1980.

4. Pennsylvania Power & Light, Letter to Darrell G. Eisenhut (NRC). Subject: Susquehanna Steam Electric Station, NUREG 0612, Control of Heavy Loads - Six Month Report. 6/22/81, ER 100450 File 842-06 PLA 857.

   4a. Pennsylvania Power & Light, Letter to Darrell G. Eisenhut. Subject: Susquehanna Steam Electric Station - Final Report, 9/24/81 PLA-937.

   4b. Pennsylvania Power & Light, Letter to A. Schwencer. Subject: Susquehanna Steam Electric Station, 6/4/82 PLA-1110.

   4c. Pennsylvania Power & Light, Letter to A. Schwencer. Subject: Susquehanna Steam Electric Station, 11/18/82 PLA-1332.

5. ANSI B30.2-1976, "Overhead and Gantry Cranes."

6. ANSI N14.6-1978, "Standard for Lifting Devices for Shipping Containers Weighing 10,000 Pounds (4500 kg) or more for Nuclear Materials."

7. ANSI B30.9-1971, "Slings."

8. CMAA-70, "Specifications for Electric Overhead Traveling Cranes."

NRC FORM 335 (11-81) U.S. NUCLEAR REGULATORY COMMISSION

BIBLIOGRAPHIC DATA SHEET

1 REPORT NUMBER (Assigned by DDC)
EGG-HS-6261

4 TITLE AND SUBTITLE
Control of Heavy Loads at Nuclear Power Plants
Susquehanna Steam Electric Station, Unit 1 (Phase 1)

2 (Leave blank)

3 RECIPIENT'S ACCESSION NO

7 AUTHOR(S)
T. H. Stickley

5 DATE REPORT COMPLETED
MONTH: April YEAR: 1983

9 PERFORMING ORGANIZATION NAME AND MAILING ADDRESS (Include Zip Code)
EG&G Idaho, Inc.
Idaho Falls, ID 83415

DATE REPORT ISSUED
MONTH: June YEAR: 1983

6 (Leave blank)

8 (Leave blank)

12 SPONSORING ORGANIZATION NAME AND MAILING ADDRESS (Include Zip Code)
Division of Systems Integration
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

10 PROJECT/TASK/WORK UNIT NO

11 FIN NO.
A6457

13 TYPE OF REPORT

PERIOD COVERED (Inclusive dates)

15 SUPPLEMENTARY NOTES

14 (Leave blank)

16 ABSTRACT (200 words or less)

The Nuclear Regulatory Commission (NRC) has requested that all nuclear plants, either operating or under construction, submit a response of compliancy with NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants." EG&G Idaho, Inc., has contracted with the NRC to evaluate the responses of those plants presently under construction. Utilities are required to report in two phases. This report contains EG&G's evaluation and recommendations for Susquehanna Steam Electric Station Unit No. 1 (SSES No. 1). Only Phase I is addressed. Phase II will be covered in a separate report.

17 KEY WORDS AND DOCUMENT ANALYSIS

17a DESCRIPTORS

17b IDENTIFIERS/OPEN-ENDED TERMS

18 AVAILABILITY STATEMENT
Make available only as specifically approved by program office.

19 SECURITY CLASS (This report)
Unclassified

21 NO. OF PAGES

20 SECURITY CLASS (This page)
Unclassified

22 PRICE
$

NRC FORM 335 (11-81)