ORGANIZATION: HITTMAN NUCLEAR & DEVELOPMENT COMPANY, INC.
COLUMBIA, MARYLAND

REPORT NO.: 99900768/82-01	INSPECTION DATE(S) 1/29/82 and 2/16-18/82	INSPECTION ON-SITE HOURS: 27

CORRESPONDENCE ADDRESS: Hittman Nuclear & Development Company, Inc.
ATTN: Mr. Barry Koh, Vice President and General Manager
9190 Red Branch Road
Columbia, MD 21045

ORGANIZATIONAL CONTACT: Mr. Barry Koh, Vice President and General Manager
TELEPHONE NUMBER: (301) 730-7800

PRINCIPAL PRODUCT: Transportation Services.

NUCLEAR INDUSTRY ACTIVITY: Transportation services for waste disposal.

ASSIGNED INSPECTOR: W. M. McNeill 3/24/82
W. M. McNeill, Reactive & Components Program Section (R&CPS) Date

INVESTIGATOR: R. E. Shepherd, RI

APPROVED BY: I. Barnes 3/25/82
I. Barnes, Chief, R&CPS Date

INSPECTION BASES AND SCOPE:

A. BASES: 10 CFR Part 71, Appendix E and 10 CFR Part 21.

B. SCOPE: This inspection was made as a result of the receipt by Region I of the Nuclear Regulatory Commission of allegations pertaining to the quality of the Hittman HN-100 (Series 1), HN-100S, and HN-200 shipping casks. In particular, the allegations related to leakage of cask lids and the impact resistance or the HN-200's impact limiter.

PLANT SITE APPLICABILITY:

Not identified.

DESIGNATED ORIGINAL
Certified By Rheanne Fouts

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A. VIOLATIONS:

1. Contrary to paragraph 21.21(a) of 10 CFR Part 21, procedures had not been adopted to provide for: (1) evaluating deviations or informing the licensee or purchaser; and (2) assuring that a director or responsible officer was informed if the supplied basic component (a) failed to comply or (b) contained a defect.

2. Contrary to paragraph 21.51(b) of 10 CFR Part 21, records were not prepared with respect to failures (in February through June 1981 testing) of Flextron Urethane 66-11 foam to meet the energy absorption characteristics described in the NRC approved Safety Analysis Report (page 71) for the HN-200 cask.

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. This inspection was performed concurrently with an investigation by the Region I Investigation and Enforcement Staff. Investigative findings are contained in Report No. 99900768/82-02.

2. Background

The Hittman casks in question, models HN-100 (series 1), HN-100S, and HN-200 are designed to carry low specific activity material, namely process solids. These casks are used by power utilities to ship wastes to burial sites. The casks can be described in general as right circular cylinders with a height of six to seven feet and diameter of five to seven feet depending on the model. The inner annulus is five to six feet deep and five to six feet in diameter. A maximum load of 11,000 to 17,000 pounds can be carried giving the casks a gross weight of 20 to 25 tons (short).

Casks, lids and bases are constructed from rolled steel plate and contain lead shielding. The lids are bolted to the casks with 24 or 30 (depending on model) one inch bolts.

The lids are sealed with ½ inch O-Rings. The HN-200 cask has two impact limiters on each end. These assemblies have eight to ten inches of urethane foam encased in steel sheet metal. P.X. Engineering fabricated the two model 100S casks and two of the HN-100 (series 1) casks. NL Industries fabricated three HN-100 (series 1) casks and Ionics fabricated the one HN-200 cask.

3. Leakage

Hittman acknowledged that from approximately 1971 to 1979 casks of these types were found at a significant frequency at sites with water in them from unaccountable sources. In October and November 1979, a number of corrective action steps were taken. A procedure was implemented which addressed the torque sequence and limits to be used in lid closure. Site personnel were trained to follow this procedure. Canvas covers over the casks were used for shipments. Guide pins which held the O-Rings in place were replaced with slightly larger diameters. Regular inspection and replacement of the O-Rings was given on a quarterly basis. It was noted that this problem has occurred with the HN-100 (series 2) cask which has a flat ¼ x 3/4 inch gasket and ratchet locking bolts. The leakage problem has decreased since late 1979, and the institution of the above corrective actions. This had been verified at sites by Hittman and the NRC inspector. Some changes have been made to the torquing procedure since 1979, namely use of higher torque limits and an additional torque sequence.

4. Foam

Hittman acknowledged that foam had been removed from the original impact limiter. The original impact limiter assembly did not have a sheet metal skin around it. The steel skin was made and the foam inserted into it. In order to accomplish this, the foam was trimmed to fit. The drawing, Safety Analysis Report and Certificate of Compliance were revised to reflect this modification of the impact limiter. These documents have been approved by the NRC. Hittman was not aware of any void areas under the steel skin of the impact limiter.

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In regard to the foam's energy absorption characteristics, Hittman acknowledged that a sample of foam had failed. Hittman maintained that this test was not representative of the foam bought in 1971 for the original impact limiter. Hittman could not find during the first visit on January 28, 1982: the test data in question; records certifying the original foam; evidence that the samples tested were different from the original foam; or records of the bases for the energy absorption characteristic curve. The inspection was unannounced which limited Hittman's ability to recall records from files. Records pertaining to the above were reviewed during the February 16-18, 1982, portion of the inspection.

Hittman does not have a written procedure addressing 10 CFR Part 21. 10 CFR Part 21 is documented as part of the QA training of Hittman personnel. 10 CFR Part 21 is posted; however, procedures had not been documented for evaluation of deviations, informing the personnel officer of evaluations, informing the Commission as appropriate, transmission of Part 21 in procurement, and control of records of evaluations. This was identified as a violation (see paragraph A.1).

Hittman stated that they did perform an informal review of the foam's energy absorption characteristic problem in light of 10 CFR Part 21. However, this review was not documented. This was identified as a violation (see paragraph A.2). This testing was viewed by Hittman as informal "screening," for the purpose of establishing vendor suitability. It was noted that testing did not follow QA program requirements with respect to approval and use of written test procedures.

Testing was performed on at least five occasions. On February 26, 1981, samples of foam and other material were given to a Hittman engineering team. Shortly after, some additional samples were sent by Flextron to Hittman which were not testable because of their shape. On or about March 18, 1981, one or more samples formed in tubes were picked up at Flextron by Hittman personnel. On June 16, 1981, an engineering-purchasing team witnessed a sample prepared in a tube. After that visit, Flextron sent a sample which was not formed in a tube but in a mold. All of these foam samples were identified as Unidur Formulation 66-11 rigid urethane except for the February samples. All of these samples reportedly failed the energy absorption testing and except for the last sample; all were reportedly high in density. Records of the test results exist only for the March 18 and June 16, 1981, samples.

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It is apparent from the above, that evidence existed indicating that the foam would not meet the energy absorption characteristics described in the Safety Analysis Report.

PERSONS CONTACTED

Company HITTMAN

Docket/Report No. 99900368

Dates 1/29/82 and 2/16/82 - 2/19/82

Inspector McNeill

NAME(Please Print)	TITLE(Please Print)	ORGANIZATION(Please Print)
HARRY FEINSTEIN	GEN. CON. & VP	HNDC
BARRY KOH	GEN. MGR & VP	"
VICKIE JOHNSTON	PURCHASING MGR.	"
CHUCK NENTWIG	DESIGN AND MFG ENG SPV.	"
CHUCK MALLORY	ENG. DIR. & V.P.	"
DAVE ZIGELMAN	PROD. APPLICATION & SALES MGR	"
KEITH MCDANIEL	ASSOC. ENG.	"
MIKE MCCAULEY	FIELD & TEST ENG. SPV	"
JOHN PAWLIK	ADM. SER. MGR.	"
BRUCE ROWE	QA MGR	"
NORM SHEPHERD	H.P. TECH.	"

Inspector McNeill

Scope/Module PART 21

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DOCUMENTS EXAMINED

1	2	TITLE/SUBJECT	3	4
RSM-011	8	SERVICE MANUAL (200)		
HNDC-0-01-3	3	CASK HANDLING PROCEDURE		2
" 0-2000-1	3	STUD TORQUING PROCEDURE		1
RSM-010	8	SERVICE MANUAL (100 S)		
RSM-008	8	" " (100 SERIES 1)		
HNDC-0-1005	3	STUD TORQUING PROCEDURE		1
HNDC-0-1001	3	" " "		1
	8	SAFTEY ANALYSIS REPORT	12/3/79	2
	9	HYDROSTATIC TESTING CERTIFICATIONS BY PX ENG & NLI FOR 100S & 100 SERIES 1 CASKS (13)		

Document Types:
1. Drawing
2. Specification
3. Procedure
4. QA Manual
5. Purchas Order
6. Internal Memo
7. Letter
8. Other (Specify-if necessary)
9. REPORTS

Columns:
1. Sequential Item Number
2. Type of Documer.t
3. Date of Document
4. Revision (If applicable)

Inspector HITTMAN

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DOCUMENTS EXAMINED

1	2	TITLE/SUBJECT	3	4
7218	8	Flextron Quotation	JAN 24 '73	—
-	6	SPEED LETTER ELDER TO JOHNSTON	6-16-81	—
40518	8	(RFQ) REQUEST FOR QUOTE	3-12-81	—
—	8	P.O. FILE of NUMBERS	—	—
—	8	TIME SHEETS ELDER ERAT NENTWIG	Wk of FEB 26	—
TSR-81-263	6	TECHNICAL SUPPORT REQUEST	5-18-81	—
" 81-320	6	" " "	6-12-81	—
—	9	CALCULATION SHEET - JUNE TESTING	6-16-81	—
—	6	DESIGN REVIEW MEMO MARCH 3	MARCH 5 81	—
—	6	11	APRIL 1 '81	—
—	6	APRIL 3	APR 7 81	—
HN-S7042	6	KOH TO MacDONALD RENEWAL LETTER ON HN200	OCT 10 '79	—
HNDL-C-200	4	QA Program for the use of Radwaste Shipping Packages	5-1-81	1
—	8	FINAL INSPECTION RECORDS OF (5) 100SR1 & 200S (2)	—	—
N35925	5	P.O. for PRESS. GAGE & IR RECEIVER DATED 7-25	7-23-80	—
		TRAINING OUTLINES USED ON 2-24-81, 2-20, 1[illegible]		

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1. Drawing
2. Specification
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5. Purchas Order
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