

EXPERT SYSTEM LICENSE EVALUATION  
REPORT FOR LICENSE SNM-00098

NAME OF LICENSEE: ENGELHARD INDUSTRIES, INCORPORATED (DELAWARE CORP)  
LISTED SITE: 113 ASTOR STREET, NEWARK 2, NEW JERSEY

--- TYPE OF ACTIVITY OR FACILITY: OTHER TYPE OF FACILITY

DESCRIPTION OF FIRST SITE AT WHICH SNM-00098 WAS USED  
ENGELHARD INDUSTRIES, INCORPORATED  
113 ASTOR STREET  
NEWARK 2, NEW JERSEY

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DESCRIPTION OF SECOND SITE AT WHICH SNM-00098 WAS USED  
ENGELHARD INDUSTRIES, INCORPORATED  
149 MURRAY STREET  
NEWARK 5, NEW JERSEY  
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Description of LICENSEE ACTIVITY UNDER THIS LICENSE  
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THE COMPANY WAS RECOVERING U-235 FROM SCRAP FUEL ELEMENTS AND USING  
U-235 AS AN ISOTOPIC STANDARD.

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The final score for SITE CONTAMINATION is: 384855  
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----- MATERIALS INFORMATION FOR THIS LICENSE -----

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--Information on type and form of materials--  
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--Authorized Material--

--Form Authorized--

PLUTONIUM/PU-239  
U-235-OVER 500 GMS

Loose or Any  
Loose or Any

AMOUNT OR ACTIVITY OF THOSE MATERIALS CONTRIBUTING TO INITIAL SCORE:

---Material--                      -SLD/LOOSE--                      POSS. LIMIT                      Unit                      -Score--

PLUTONIUM/PU-239                      LOOSE                      .00200000                      GM                      0.8

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U-235-OVER                      LOOSE                      170007.00                      GM                      2729.3  
500 GMS  
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INITIAL SITE SCORE, based on LOOSE material possession limits: : 2730

FINAL DECISION FOR LOOSE MATERIALS:

POTENTIAL SITE CONTAMINATION:  
HIGHEST PRIORITY FOR REVIEW

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The final SCORE for SITE CONTAMINATION is: 384855  
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SEQUENCE OF RECORDED REASONING

1. There was more than one identifiable site with this license. The  
final score will be the sum of the scores for the sites used

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under this license. Succeeding conclusions will indicate which site

2. Each site (or two groups) will be evaluated, with the assumption that all materials authorized on the license could have been used at each site. The final score will be the sum of the site scores.
3. FIRST SITE: EVIDENCE IN FILE and knowledge of materials and usage were sufficient to lead the reviewer to suspect building contamination. Score raised by a factor of 1.5
4. FIRST SITE: There was some decon of facility or site at CLOSEOUT  
Score= $0.9 \times \text{score}$
5. The reviewer's judgment was that significant outdoor contamination was very unlikely to have occurred under this license at this site . Score= $\text{score} \times 0.90$
6. FIRST SITE: There was insufficient information in file to determine the likelihood of release to atmosphere or to environment from activities at this site.
7. FIRST SITE: There was significant use of glove boxes, hoods, or protective clothing. Change in score depends on reviewer response to subsequent questions.
8. FIRST SITE: Contaminated material was probably appropriately disposed of Score not changed,
9. FIRST SITE: There was significant generation of contaminated material from machinery or machinery cleanup at facility.  
Score= $\text{score} \times 1.5$
10. FIRST SITE: Contaminated material from machinery or machinery cleanup was probably appropriately disposed of. Score= $\text{score} \times 1.0$
11. FIRST SITE: There was evidence that solid waste was generated in the operation. Score= $\text{score} \times 1.5$
12. FIRST SITE: Possible inappropriate disposal or abandonment of contaminated solid waste. Score= $\text{score} \times 1.4$
13. FIRST SITE: There was evidence that liquid waste was generated in the operation. Score= $\text{score} \times 1.5$

14. FIRST SITE: Possible inappropriate disposal or abandonment of contaminated liquid waste.  $\text{Score} = \text{score} * 1.4$
15. FIRST SITE: There was CONCRETE EVIDENCE OF POTENTIALLY SIGNIFICANT BURIAL OR DUMPING at the site.  $\text{Score} = \text{score} * 2$
16. FIRST SITE: The reviewer's judgment of activities or license indicates a reasonable likelihood of considerable turnover of licensed amounts under this license.  $\text{Score} = \text{score} * 1.4$
17. FIRST SITE: There were clearly licensed materials left onsite, or not disposed of properly.  $\text{Score} = \text{score} * 1.5$
18. FIRST SITE: There was NO closeout survey for this site. Score multiplied by 1.8
19. FIRST SITE: There was NOT an NRC FINAL INSPECTION of the facility. Score not changed.
20. SECOND SITE: EVIDENCE IN FILE and knowledge of materials and usage were sufficient to lead the reviewer to suspect building contamination. Score raised by a factor of 1.5
21. SECOND SITE: There was some decon of facility or site at CLOSEOUT  
 $\text{Score} = 0.9 * \text{score}$
22. The reviewer's judgment was that significant outdoor contamination was very unlikely to have occurred under this license at this site.  $\text{Score} = \text{score} * 0.90$
23. SECOND SITE: There was insufficient information in file to determine the likelihood of release to atmosphere or to environment from activities at this site.
24. SECOND SITE: There was significant use of glove boxes, hoods, or protective clothing. Change in score depends on reviewer response to subsequent questions.
25. SECOND SITE: Possible inappropriate disposal or abandonment of contaminated material from glove boxes, hoods, clothing.  
 $\text{Score} = \text{score} * 1.4$
26. SECOND SITE: There was significant generation of contaminated material from machinery or machinery cleanup at facility.  
 $\text{Score} = \text{score} * 1.5$

27. SECOND SITE: Possible inappropriate disposal or abandonment of contaminated material from machinery or machinery cleanup. Score=score\*1.2
28. SECOND SITE: There was evidence that solid waste was generated in the operation. Score=score\*1.5
29. SECOND SITE: Possible inappropriate disposal or abandonment of contaminated solid waste. Score=score\*1.4
30. SECOND SITE: There was evidence that liquid waste was generated in the operation. Score=score\*1.5
31. SECOND SITE: Possible inappropriate disposal or abandonment of contaminated liquid waste. Score=score\*1.4
32. SECOND SITE: There was CONCRETE EVIDENCE OF POTENTIALLY SIGNIFICANT BURIAL OR DUMPING at the site. Score=score\*2
33. SECOND SITE: The reviewer's judgment of activities or license indicates a reasonable likelihood of considerable turnover of licensed amounts under this license. Score=score\*1.4

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COMMENTS FOR LICENSE EVALUATION

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Description of LICENSEE ACTIVITY UNDER THIS LICENSE

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THE COMPANY WAS RECOVERING U-235 FROM SCRAP FUEL ELEMENTS AND USING U-235 AS AN ISOTOPIC STANDARD.

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Reviewer's comments concerning potential TURNOVER OF MATERIALS  
THE COMPANY INDICATED THAT THEY COULD PROCESS 1 KILOGRAM OF HIGHLY ENRICHED URANIUM EACH WORKING DAY AND 5 KILOGRAMS OF ENRICHED URANIUM DAILY. THIS INDICATED THAT THE MATERIAL COULD HAVE BEEN USED AT A FREQUENT RATE, BUT THE PROCESS WAS NEVER DOCUMENTED TO BE THIS EFFICIENT. ACCORDING TO THE CERTIFICATE OF DISPOSITION, THE MATERIAL WAS DISPOSED OF IN COMPLIANCE WITH 10 CFR 20. THE COMPANY INDICATED THAT THEY WOULD BE RELEASING MATERIAL TO THE ATMOSPHERE THROUGH THEIR STACKS, DISPOSING OF MATERIALS BY SEA BURIAL, AND FLUSHING THE MATERIAL DOWN THE SEWER SYSTEM.

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Reviewer's comments concerning potential CONTAMINATION  
THE COMPANY INDICATED IN A LETTER TO THE AEC, THAT THE BUILDINGS AT BOTH SITES WERE CONTAMINATED. THE COMPANY HAD REPLACED THE FLOORS AND REPAINTED THE INTERIOR WALLS OF THE BUILDINGS. THE OPERATING EQUIPMENT HAD BEEN REMOVED, CLEANED, AND PLACED IN STORAGE, EXCEPT FOR A WASHING MACHINE AT THE MURRAY SITE. THIS MACHINE WAS TO BE DISPOSED OF AS SPECIAL NUCLEAR MATERIAL BY THE RADIOLOGICAL SERVICE COMPANY. THERE WAS NO CLOSEOUT SURVEY LOCATED IN THE FILE, BUT A LETTER IN THE FILE INDICATED THAT THE AEC HAD CONDUCTED A SURVEY AT BOTH SITES. ANOTHER LETTER FROM THE RADIOLOGICAL SERVICE COMPANY TO ENGELHARD INDUSTRIES INDICATED THAT THEY HAD ALSO CONDUCTED A SURVEY AT BOTH SITES. BOTH SITES WERE FOUND TO BE FREE OF RADIOACTIVE CONTAMINATION.

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Reviewer's comments concerning potential GENERATION OF WASTE  
THE COMPANY DEFINITELY USED AND CONTAMINATED THE EQUIPMENT. THE COMPANY STATED THAT THIS MATERIAL HAD BEEN DECONTAMINATED AND PLACED IN STORAGE. NO OTHER INFORMATION WAS GIVEN. THE COMPANY UTILIZED PROTECTIVE EQUIPMENT AS WELL. RESPIRATORS, HOODS, AND OTHER TYPES OF VENTILATING EQUIPMENT WERE USED. THE FILTERS FROM THESE ITEMS WERE PLACED IN STEEL DRUMS AND HELD FOR LATER DISPOSAL. A COMPLIANCE INSPECTION REPORT DTAED JULY 1961, INDICATED THAT A DRUM CONTAINING FILTERS WAS STILL ON SITE. THE COMPANY GENERATED LIQUID WASTES THAT CONTAINED PLUTONIUM AS WELL. THIS MATERIAL WAS ALSO PLACED IN STEEL DRUMS AND DUMPED AT SEA. THE LIQUID WASTES CONTAINING URANIUM WERE DILUTED AND RELEASED TO THE SEWER SYSTEM. TWELVE DRUMS OF SOLID WASTE CONTAINING SPECIAL NUCLEAR MATERIAL WERE TAKEN TO NUCLEAR ENGINEERING, A COMMERCIAL WASTE DISPOSAL COMPANY. GASEOUS FISSION PRODUCTS WERE TO BE VENTED THROUGH THE STACKS AT THE SITE. THE NON-GASEOUS FISSION PRODUCTS WERE COLLECTED AS LIQUID WASTE AND BURIED AT SEA BY A DISPOSAL COMPANY.

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- GENERAL COMMENTS ENTERED BY THE REVIEWER CONCERNING THE EVALUATION -  
-- THE LICENSEE WAS AUTHORIZED 170.007 KILOGRAMS OF U-235 CONTAINED IN  
-- URANIUM ENRICHED IN THE U-235 ISOTOPE AND 0.002 GRAMS OF PLUTONIUM  
-- AND BY PRODUCT MATERIALS FROM USED FUEL ELEMENTS OBTAINED FROM THE  
-- NETHERLANDS. THE COMPANY WAS TRYING TO RECOVER ENRICHED URANIUM FROM  
-- SCRAP MATERIALS. THE COMPANY WAS ALSO USING THE URANIUM AS AN  
-- ISOTOPIC STANDARD. THE PLUTONIUM AND THE OTHER BY PRODUCT MATERIALS  
-- WERE OBTAINED FROM USED FUEL ELEMENTS. ALL THESE MATERIALS WERE  
-- DISPOSED OF ACCORDING TO 10 CFR 20, WHICH INCLUDED RELEASE TO THE  
-- SEWER SYSTEM, RELEASE THROUGH THE STACKS, AND BY BURIAL AT SEA. THE  
-- COMPANY INDICATED THAT THE BUILDINGS THAT WERE USED IN THE SCRAP  
-- RECOVERY OPERATION WERE CONTAMINATED. THE COMPANY ALSO INDICATED  
-- THAT A FINAL SURVEY HAD BEEN COMPLETED BY THE RADIOLOGICAL SERVICE  
-- COMPANY AND THE AEC. HOWEVER, THERE WAS NO CLOSEOUT SURVEYS LOCATED  
-- IN THE FILE. THE LICENSE ALSO APPEARS TO HAVE BEEN TERMINATED, BUT  
-- THERE IS NO ACTUAL DOCUMENTATION TO SUPPORT THIS EITHER.

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END OF COMMENTS FOR LICENSE EVALUATION

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--- EXPERT SYSTEM EVALUATION WAS BASED ON THE ---  
---- FOLLOWING INVENTORY RECORD ----

Docket Number: 70-00090

REGION RESPONSIBLE: I

LICENSEE NAME: ENGELHARD INDUSTRIES, INCORPORATED (DELAWARE CORP)

STREET ADDRESS: BAKER PLATINUM DIV. 113 ASTOR City: NEWARK 2

FIPS state code (principal operation): NJ

Site used: 113 ASTOR STREET, NEWARK 2, NEW JERSEY

Disposition information present: CERTIFICATE AND LETTER

Contents of letter: LETTERS TO THE AEC.

Info on disposal: NUCLEAR ENGINEERING

This license was listed as expired on 07/31/62

GENERAL INVENTORY RECORD COMMENTS:

SCRAP RECOVERY PROCESSES (U-235, BYPRODUCT, PLUTONIUM)

JOB NUMBER: 0275 BOX NUMBER: 03

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COMMENTS ON INVENTORY ENTRY FOR SNM- 00098

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A CERTIFICATE OF DISPOSITION INDICATED THAT THE WASTE WAS DISPOSED OF IN COMPLIANCE WITH 10 CFR 20. A LETTER TO THE AEC INDICATED THAT THE LIQUID WASTE PRODUCED IN THE SCRAP RECOVERY WAS DISPOSED OF TO THE SEWER SYSTEM.

THE FLUSHING APPEARED TO BE A DAILIY ACTIVITY. THE SOLID WASTE SUCH AS THE FILTERS AND RESIDUES, WERE DISPOSED OF THROUGH A LICENSED DISPOSAL AGENCY, NUCLEAR ENGINEERING. THE PLUTONIUM GENERATED FROM THE REPROCESSING OF FUEL ELEMENTS WAS TO BE BURIED AT SEA BY A LICENSED DISPOSAL COMPANY. BYPRODUCT MATERIALS (FISSION PRODUCTS) WERE TO BE RELEASED THROUGH STACKS IN THEY WERE GASEOUS AND BURIED AT SEA IF THEY WERE LIQUID WASTES.

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Date of last evaluation or revision: 05/22/94