



Metropolitan Edison Company
Post Office Box 480
Middletown, Pennsylvania 17057

Writer's Direct Dial Number

January 15, 1981
LL2-81-0010

TMI Program Office
Attn: Mr. Lake Barrett, Deputy Director
U. S. Nuclear Regulatory Commission
c/o Three Mile Island Nuclear Station
Middletown, Pennsylvania 17057

Dear Sir:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
EPICOR II Resin Solidification Procurement Specifications

On November 17, 1980, we forwarded to you for your comments, via our TLL 545, a copy of the Technical Requirements portion of the Procurement Specification for an EPICOR II Resin Solidification Service.

The request for Proposal of which the above was a part was sent to prospective bidders on December 5, 1980. A pre-bid conference, attended by interested bidders (and an NRC representative) was held on December 18, 1980.

On December 31, 1980, bidders were sent further information on the Request for Proposal, a copy of which is enclosed for your information. If you have any comments or questions, please contact Mr. R. I. Newman, Extension 8461.

Sincerely,

G. K. Hovey
Vice-President and
Director, TMI-2

GKH:RIN:djb

Attachments

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Rec'd
3/11



Metropolitan Edison Company
Post Office Box 480
Middletown, Pennsylvania 17057

Writer's Direct Dial Number

(717) 948-8501

December 31, 1980

C-0452

Transnuclear, Incorporated
ANEFco, Incorporated
Hittman Nuclear & Dev. Corp.
Boeing Eng. & Cont. Company
Chem-Nuclear Systems, Inc.
Delaware Custom Material, Inc.
Capolupo & Gundal, Inc.
EPICOR, Inc.

- Geoffrey J. Quinn
- Mark H. Kirshe
- Thomas B. Johnson
- George Dymmel
- Donald E. Burroughs
- Howard Novitch
- Richard S. Capolupo.
- Joseph Levendusky

RE: Solidification of 25 EPICOR Liners,
Inquiry No. 85099, Addendum No. 1

Gentlemen:

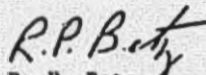
On December 5, 1980, a Request for Proposal was sent to your firm requesting a bid on the subject project.

Please be advised that the Request for Proposal is hereby amended as follows:

1. The due date for submissions of Proposals is hereby extended to January 27, 1981 at 2:00 P.M.; and
2. The following documents shall become part of the BID DOCUMENTS:
 - (a) Document entitled "PRE-BID CONFERENCE: SOLIDIFICATION - ADDITIONAL INFORMATION" consisting of one page and two attachments.
 - (b) Document entitled "Errata:", consisting of one page
 - (c) Document entitled "Questions From Bidder's Conference", consisting of ten pages, Table 1, and Attachment #1.

In all other respects, the BID DOCUMENTS remain unchanged. Please acknowledge receipt of this Addendum #1 by signing and returning the enclosed copy of this letter.

Very truly yours,



R. P. Betz
TMI Contract Administrator

RPB/cw

Enclosure

PRE-BID CONFERENCE: SOLIDIFICATION

ADDITIONAL INFORMATION

This information will be incorporated into the final bid package.

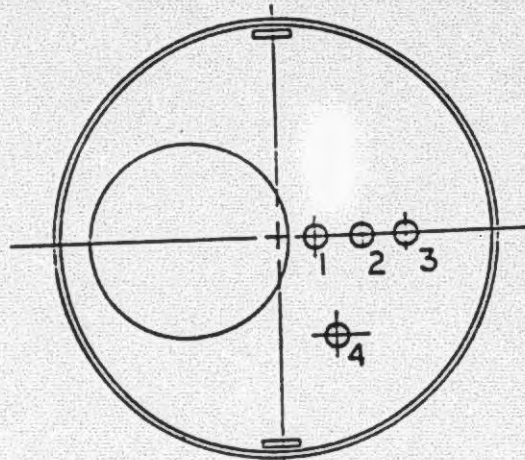
1. GPU is seeking services to solidify two (additional) liners aside from those defined in the Bid Document Package:

<u>Liner</u>	<u>Size</u>	<u>Curie Loading</u>
DS7	6x6	4.6 Ci
DF15	4x4	71 Ci

Where it appears in the Bid documents, please change the number 23 to 25 when referencing the number of liners to be solidified.

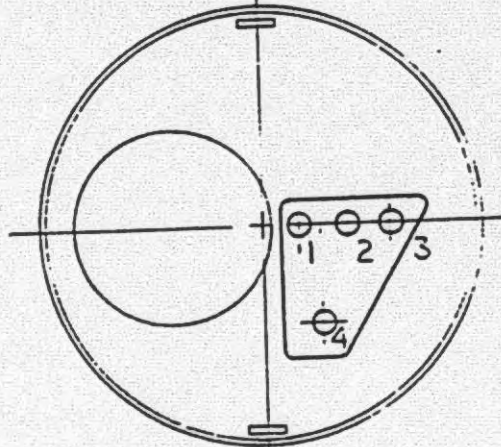
2. TMI-II Radwaste is handled under special requirements. GPU will make all arrangements toward burial at a licensed site. The Washington site (NECO) is referenced in Specification 1102-26-001, Rev. 0, as a potential burial site only.
3. Additional drawings (attached).

FIGURE 1



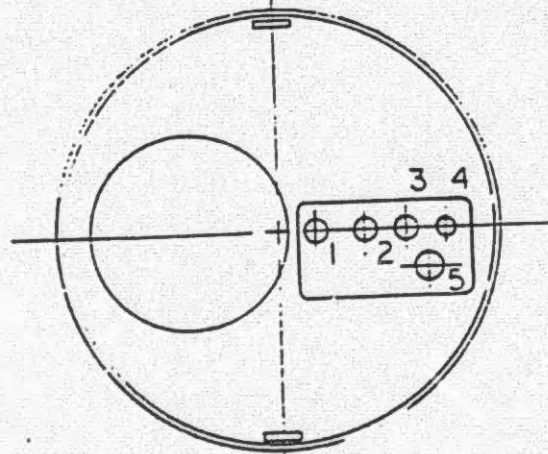
- 1. INLET
- 2. OUTLET
- 3. VENT
- 4. LEVEL

FIGURE 2



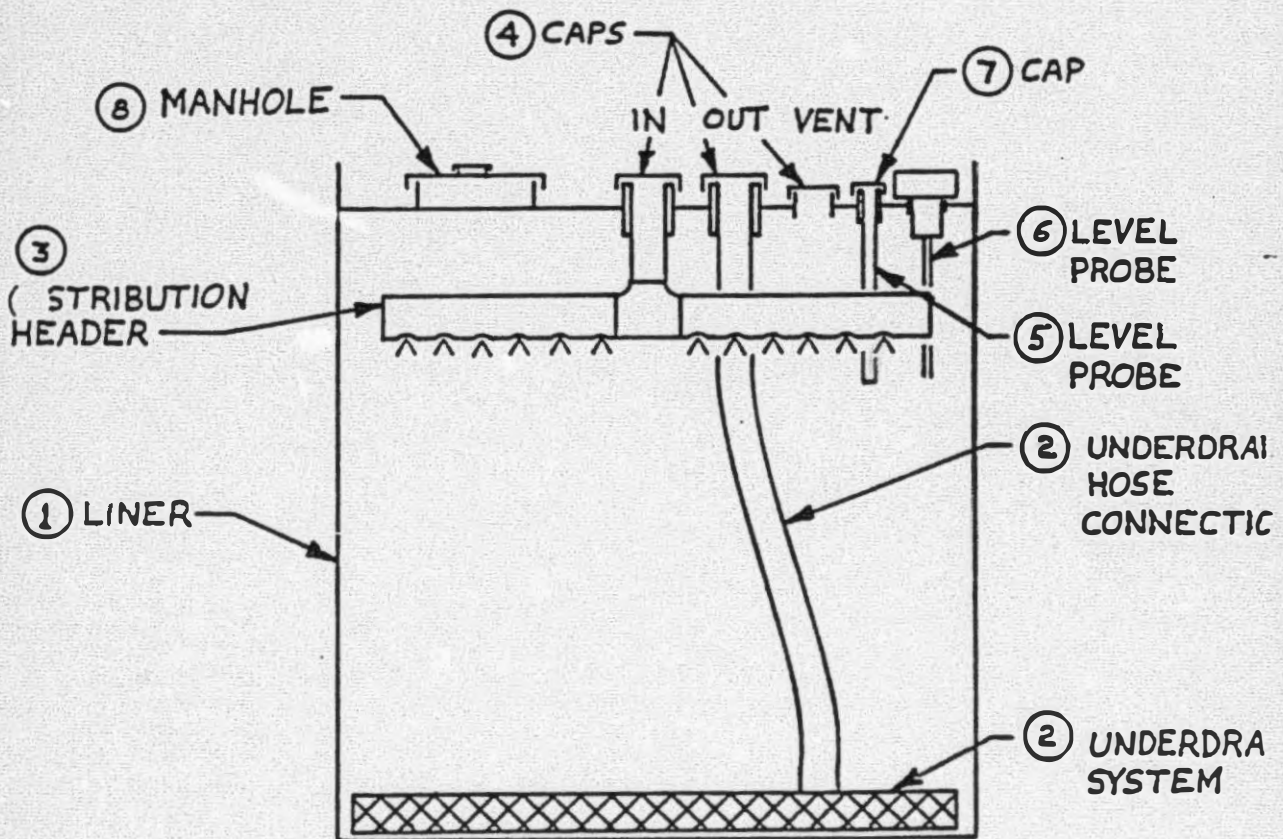
- 1. INLET
- 2. OUTLET
- 3. VENT
- 4. LEVEL

FIGURE 3



- 1. INLET
- 2. VENT
- 3. OUTLET
- 4. BUBBLE
- 5. PROBE

TMI II
EPICOR II RADWASTE SYSTEM
TYPICAL LINER INTERNALS



Errata:

- 3.2.2 Revised Definition of Solidification - Solidification shall be the conversion of radioactive spent demineralization media to a homogeneous (uniformly distributed), monolithic, immobilized solid with definite volume and shape, bounded by a stable surface of distinct outline on all sides with no free liquid. On arrival at the burial site any free liquid detectable in the container shall be the lesser of .5% of the container volume or one gallon.

Attachment 2.0 Wasteform Requirements

Add

Free Liquid

The full size sample shall be examined by visually inspecting the top interior of the container and by removing the bottom of the container. There shall be no free liquid.

Questions From Bidder's Conference

1. What is required integrity or material of the packaged solidified wasteform? Do the EPICOR II liners, as they presently exist, qualify as an acceptable package?

The EPICOR II liners are designed as strong tight containers but have not been qualified to any DOT specification. The contractor shall take this into consideration when addressing this requirement in the certificate of compliance for the type B transport package that would be compatible with the liners. See question 5 below.

2. It has been found that sampling of the solidified wasteform by coring may damage the sample itself. Therefore: What will be the sampling mechanism and criteria by which the solidified wasteform is checked. Will all the solidified packages be checked? Will only the non-radioactive, full-scale, solid be tested?

Destructive examination of the full scale test is required. Sawing the monolith appears acceptable. If the bidder has an alternate method of determining structural integrity he should specify the alternate method in his proposal.

It is not GPU's intent to check the radioactive packages but to qualify the waste form according to ANSI/ANS-55.1 1979 and Branch Technical position ETSB 11-3 (Rev.1) by implementation of an approved process control program. If the bidder wishes to qualify his process using methods to detect free liquids within each container prior to shipment he should specify the method as an alternate in his proposal.

3. What are NECO (Hanford Site) Burial costs for bidder estimation of transport and burial of his final wasteform? Per dose rate and volume?

The bidder may use the attached Washington Nuclear Center and Nevada Nuclear Center: Schedule of charges effective November 17, 1980 for estimating his system costs (Table 1).

4. Will the SN-1 cask be available (definitely)? Will the cask have a trailer also? Therefore, must the contractor only estimate tractor and burial costs for his packages (if suitable for SN-1 transport)?

Table 1: WASHINGTON NUCLEAR CENTER AND NEVADA NUCLEAR CENTER

SCHEDULE OF CHARGES

RADIOACTIVE WASTE

POOR ORIGINAL

1. Disposal Charges

A. Solid Material

Steel Drums, Wood Boxes, Liners:

R/HR AT CONTAINER SURFACE

PRICE PER CU. FT.

0.00 -	0.20	\$ 8.70
0.201 -	1.00	9.50
1.01 -	2.00	10.65
2.01 -	5.00	13.00
5.01 -	10.00	15.35
10.01 -	20.00	19.90
20.01 -	40.00	24.65
40.01 -	60.00	37.75
60.01 -	80.00	45.35
80.01 -	100.00	50.00
Over 100.00		By Request

Disposable Liners Removed From Shield:

R/HR AT CONTAINER SURFACE

SURCHARGE PER LINER

PRICE PER CU. FT.

0.00 -	0.20	No Charge	\$ 8.70
0.201 -	1.00	\$ 119.00	8.70
1.01 -	2.00	292.00	8.70
2.01 -	5.00	411.00	8.70
5.01 -	10.00	594.00	8.70
10.01 -	20.00	758.00	8.70
20.01 -	40.00	941.00	8.70
40.01 -	60.00	1,116.00	8.70
60.01 -	80.00	1,288.00	8.70
80.01 -	100.00	1,463.00	8.70
Over 100.00		By Request	By Request

B. Liquid Scintillation Vials \$11.50/cu. ft.

C. Biological Waste, Animal Carcasses \$ 9.50/cu. ft.

D. State of Washington Surcharge \$0.30/cu. ft.

2. Surcharge For Heavy Objects:

Less than 10,000 pounds No Charge
10,001 pounds to Capacity of Site Equipment \$87.50 plus \$.02 per lb. above 10,000 lbs.

3. Surcharge For Curies (Per Load):

Less than 100 curies No Charge
101 - 100 curies \$ 660.00
101 - License Limits \$ 660.00 plus \$.09 per curie

4. Minimum Charge Per Shipment:

\$ 224.00

5. Cask Handling Fee:

\$ 335.00 minimum each

6. Waste Containing Chelating Agents in Packages Amount Greater than 1% of Package Volume:

By Request

7. Surcharge for Non-routine Man-Rem Exposure (due to design or physical defect of container or shield):

\$ 12.35 per man millirem

8. Decontamination Services (if required)

\$ 45.00 per man hour plus supplies at
cost plus 15%

9. Container Volumes:

55 Gallon Drums - 7.59 cu.ft.
30 Gallon Drums - 4.01 cu.ft.
5 Gallon Drums - 0.67 cu.ft.

The SN-1 cask is in the process of certificate of compliance renewal. For the purpose at this proposal the bidder may assume the COFC will be approved.

The cask will be furnished with a trailer for the purpose of comparing alternate cask systems. A 200 dollar a day rental charge will be assigned to the SN-1 cask.

5. What is pH of resins to be solidified? What are boron, sodium loadings?

For the purpose at designing an alternate liner, a pH between 2 and 9 should be assumed. The boron and sodium loadings on the resin are given in Table 2. The spent resin liners covered by this R.F.Q. contain resins supplied by Epicor, Incorporated. Commercially available resins should be assumed to be present in the liners. Specifically, various mixes and combinations of cation and anion organic resins as well as inorganic resinous materials are utilized. While in service, chemical and radioisotope contaminants are removed from the processed water by the liners. Sample data is available upon request which identifies the major chemicals and radioisotopes removed by each liner.

After processing, the beds washed with 20 to 50 gallons of demineralized water allowing the pH to equilibrate. It is expected the pH of any residual free standing water will be between 5.0 and 8.0. The resins were not taken to full capacity exhaustion.

6. If container decays, is the contractor at fault? (i.e., his cement or our resins?)

Performance criteria will be negotiated with final contract award. However, if contractor uses a container with GPU-accepted Quality Assurance and follows an approved Process Control Program (PCP), the contractor is not liable.

7. What is the present status of the EPICOR liners to be solidified? Do they contain gases? If so, what pressure and gases can be anticipated? Do the liners contain water?

Resin physical and chemical states can change with time. Three main effects to be accounted for are radiolytic, chemical and aging breakdown. The radiolytic effects have been reviewed and estimated. Available literature indicates almost insignificant effects on the resins. Gases are one by-product of radiation breakdown. The liners are air tight up to 2 psi. The supplier should assume the liners are under a pressure of 2 psi and provide procedures and hardware to accommodate this overpressure during initial venting operations. It should be assumed the gases contain residual contamination and therefore handled accordingly with proper ALARA personnel protection. It should

Table 2: Na and B loadings

<u>Liner Identification</u>	<u>lbs. Na</u>	<u>lbs. Boron</u>
DS-1	0.101	109.25
DS-2	1.764	148.17
DS-3	.013	30.54
DS-4	.0	.018
DS-5	7.075	199.15
DS-6	.788	106.01
DS-7	.049	52.92
DF-1	0.233	32.6
DF-2	3.16	50.8
DF-3	2.32	21.5
DF-4	3.10	24.4
DF-5	2.84	34.7
DF-6	0.861	30.0
DF-7	0	24.1
DF-8	4.82	13.3
DF-9	6.86	11.6
DF-10	0.098	37.1
DF-11	3.69	43.0
DF-12	0.587	50.9
DF-13	0.007	93.9
DF-14	10.01	13.07
DF-15	0.396	10.44
PF-5	3.71	10.87
PF-6	0.40	5.78
PF-10	0.636	130

be assumed the polymeric and cross linkage breakdown of cationic and anionic organic resins are equivalent to typical aging breakdown. Any inorganics will not undergo breakdown. Chemical breakdown is typically due to the formation of peroxides which then attack the resin matrix. It is not projected that peroxides will be formed to a significant degree such that minimal effects will be realized. No nitrated resins are used in these liners and no nitrates have been deposited. The natural aging degradation of anion and cation resins will occur with anions undergoing the most significant breakdown. This effect is reasonably well understood and characterized in the open literature.

8. What is the Milestone schedule referred to in the Technical Requirements Section?

The following Milestone Schedule is a rough estimate of the proposed solidification schedule. The actual schedule will depend upon the system requirements, procedural reviews, NRC interface, and a number of other parameters.

	Week of:
RFQ out for bid	December 1, 1980
Prebid Conference	December 12, 1980
Proposal Due	January 27, 1980
Notice of Award	March 15, 1980
Mobilize on TMI	June 1, 1981
Demobilize	October 1, 1981

9. Will the full-scale, non-radioactive, solidification test occur before or after NRC approval of contractor's Process Control Program?

The test will be before NRC approval of the PCP with the test results forming a part of the submittal. The solidification medium and associated mixtures must be compatible with the resins to guarantee solidification with no remaining free standing water. Because the material to be solidified can not be precisely characterized it is incumbent upon the supplier to accommodate chemical and radiolytic variations. The Process Control Program must provide the means to ensure solidification. Any variation other than herein identified should be capable of being detected by the Process Control Program and solidification mixtures adjusted accordingly to accommodate such variations. The method of attaining such guarantee must be fully described and included in the suppliers proposal. It should be reemphasized the Process Control Program must be flexible enough to accommodate the material identified herein and its associated variations.

10. What use can the contractor expect of the storage modules? Can he build a temporary, weather-proof shelter on top of the modules, from which he can sluice, or in which he can work?

The contractor may use the storage modules as a processing area. The storage modules contain round holes (7 ft. diam. x 13 ft. depth) with sump protection, and which presently house the liners. He may erect a temporary shelter.

11. What is status of the interim staging module? Can we use these for solidification area?

For the purpose at this proposal the interim staging modules will not be available.

12. What will be the time delay for movement of liners via GPU crane?

Approximately four (4) hours.

13. What is availability of temporary building material on TMI-II site? Can GPU supply this?

Any temporary building will be supplied and built by the contractor.

14. Article XVI Proprietary Information - Will the requirements stated in Article XVI be applicable to Section 6.3 of Specification 1102-26-001, and provide proprietary protection to another mix specification.

GPU will protect any proprietary mix specification.

15. Will GPU wish to continue use of the services or acquire a solidification unit if the 25 liner program is successful? This refers to the balance of the EPICOR II liners and the SDS units.

While the outcome of the Twenty-five (25) liner program will affect GPU's decision, the status of disposal of remaining EPICOR II liners and the future SDS units is unknown.

16. Section 2:References - Will References 3., "TMI Unit II Resin Sluicing Test Program", and 5., "Recovery Quality Assurance Plan", be provided at the Pre-Bid Conference?

No. These documents are not necessary for the contractor to make his proposal.

Reference 3 concludes "EPICOR II liners will permit resin sluicing of virtually all resin inventory for solidification purposes."

Reference 4 is not yet available. The result of the Test Program are summarized in Section 6.2 of Specification 1102-26-001 (Rev.0). The mix formulation mentioned in that section was the highest resin to cement ratio that yielded a successful solidification for all resin mixes present in the EPICOR liners. The contractor may elect to propose a lower resin to cement ratio.

Reference 5 describes the TMI site Quality Assurance Plan. This shall not be needed for contractor proposal.

17. Please clarify equipment criteria - "portable, non-permanent", as defined in Section 3.1.3.

Large capital investment permanent facilities are not acceptable.

18. Is there any additional information available on the powdered and inorganic materials which are mixed with the bead resins? Reference 3.1.5. If so, could this be provided under an approved secrecy agreement?

No

19. Will there be additional criteria for the solidified product as currently defined in Section 3.2 Definitions? For example; A - Leachability; B - Mechanical Strength; C - Disintegration Resistance to Water.

Leachability - no criteria

Mechanical Strength - As a guideline, compressive strengths of 500 psi or more are desirable.

Disintegration Resistance to water - no criteria

20. What is the water content of the following:

- a. Dewatered bead resins,
- b. Dewatered bead resins and powder,
- c. Dewatered bead resins, powder and inorganic ion exchange material.

The liners have all been dewatered by the same method. For the purpose of this proposal the bidder should assume there is less than 1 gallon of water in any liner.

21. Is the full-scale solidification test period included into the 120-day period for equipment lease? Reference 4.1.1.

GPU will pay the contractor for the full-scale solidification test. The 120-day period for equipment lease is not a definite term of the contract. Weekly equipment rental rates are asked for in the proposal, and will be used for evaluative purposes.

22. Please define anti-contamination and radiation protection supplies. Reference section 4.1.4 of specification 1102-26-001, (Rev.0).

GPU will supply all necessary health physics equipment and personnel. This includes protective clothing, area monitoring, TLD's, personnel dosimetry, etc.

23. Please define the requirements for technical assistance by the contractor in Section 4.1.5 and 4.1.6. What was defined, indicated considerable manpower. GPU estimate is desired.

(Section 4.1.5) The vendor must meet the NRC requirements for documentation. This includes a Process Control Program: a detailed operating instruction prepared by the vendor with his statement that the unit, operated in accordance with the Program, will produce the intended product. In addition the vendor must supply a General Description of the System.

The vendor will write these documents and submit them for GPU approval. This work will be done on a Time and Materials basis.

(Section 4.1.6) The vendor will also have to provide any analysis of his equipment required for an ALARA review; i.e. to determine operating personnel exposure. If vendor has any information on Man-Rem exposure for his operation, he should supply this with his proposal.

24. Please clarify the requirements of Section 4.2.2 with regard to materials, waste effluents and utility requirements.

The work described in Section 4.2.2 will not be done under the same contract by which solidification of the resins is performed. The vendor should indicate his capability of performing the work of Section 4.2.2 in the "Proposal" form. Bidder should not specify a lump sum to perform the work referred to under Section 4.2.2, as was requested in Section C, page 3 of the Proposal form. Bidder should specify crew size and labor rates required for the work, rather than a lump sum.

25. In the event the decon wastes require solidification, is this part of the 120-day period equipment lease?

The vendor will solidify all liquid wastes which are created in the resin solidification process. Upon completion of the solidification, vendor may produce liquid waste from the clean-up of his system. These wastes will not have to be solidified. Contractor should estimate volume and activity of unsolidifiable liquid radwaste produced in system clean-up within his proposal.

26. Please provide crane capacity and specifications.

75 tons capacity with 110 foot boom.
150 tons capacity with 70 foot boom.

27. Are there additional utilities available in addition to those specified in Section 5.1.6? For example: instrument air, waste line drains and demin water.

The additional utilities on-site include those given as examples. Vendor should specify the services required by his system. (see Proposal form, Section VI, part J.)

28. What is the boric acid or any other inhibiting agent concentration in the water or the devatered resin? Reference 6.2.

See question 5.

29. Please provide information on the water source and quality as listed in the mix specification in Section 6.2.

Tap water from Columbia, Maryland

30. Please define "a suitable solidified product" as referenced in Section 6.6 Is this the definition in Section 3.1.1, 3.2.2, or other?

Conforming to the definition of Section 3.2.2 (amended: see Question 2). The product should be homogeneous, monolithic, of definite volume and shape, etc., with no free liquid.

31. Please define, "means and frequency of product verification". Reference Section 8.1.3.

Output quality of the Vendor's system must be verified. (see Question 2)

32. Because of the requirements for the technical evaluation report and other technical assistance, plus the periods for review and approval, the overall GPU target schedule would be helpful in the contractor planning and response to the Request for Proposal. Provide the GPU planning schedule at the Pre-Bid Conference.

(see Question 8)

33. Will GPU make available full-scale drawings referenced in the proposal package?

Two liners drawings (JS070880 and BLG2579) are attached regarding Question 1. The details of the liner physical piping arrangements are not available for distribution, however, attachment #1 provides a general presentation of this arrangement.

34. Are there any laws, ordinances, rules, regulations or orders of any public authority that may apply to the performance of work defined in the specification 1102-26-001 at the TMI site? If so, please define and provide information.

The number of laws, ordinances, rules etc. which apply to work at a nuclear site are numerous. However, there are none that specifically apply to this specification.

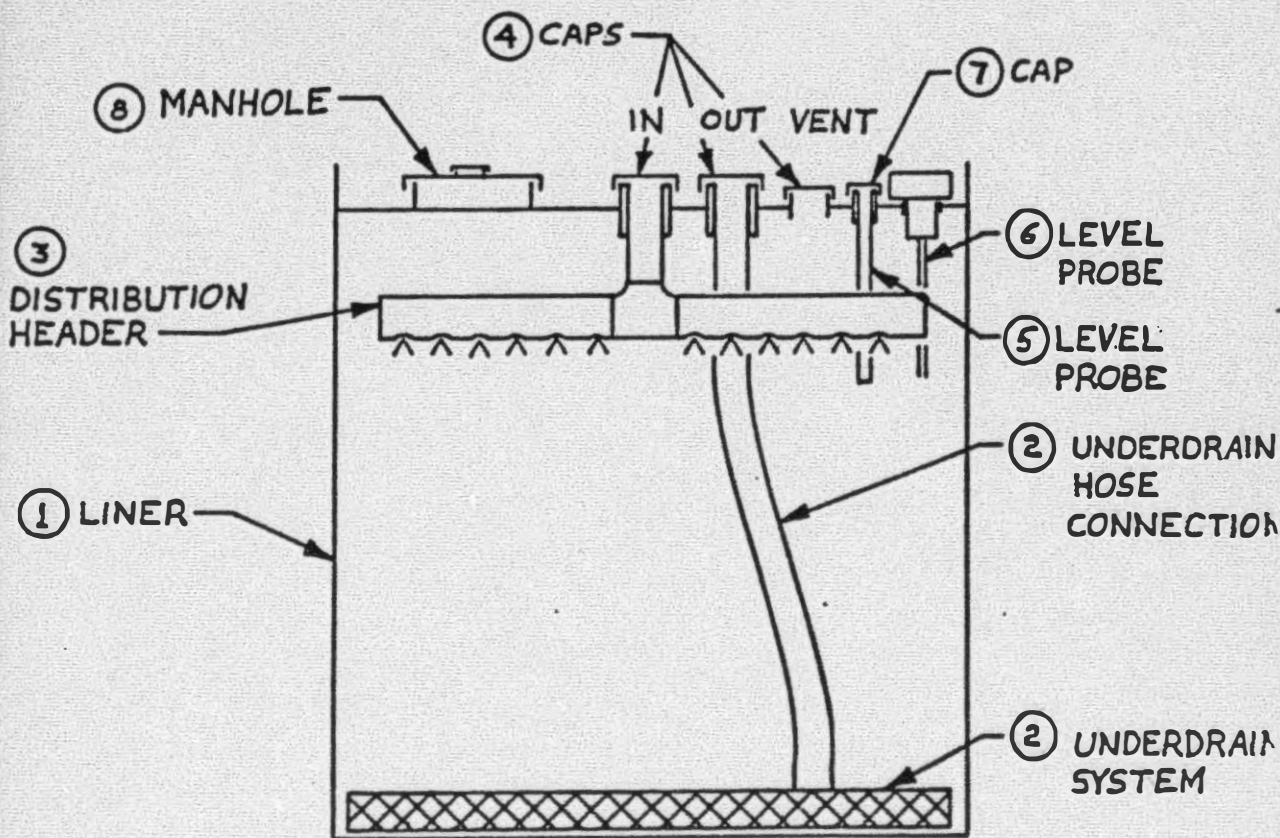
35. Please clarify the intent of enclosing Attachment 3.0, outline for topical reports on solidification systems. It was not referenced in the bid documents.

A Topical Report on the Vendor's solidification system is no longer necessary. However, the subjects outlined in Attachment 3.0 will be addressed in reviewing the successful bidders equipment.

Attachment #1

TMI II

EPICOR II RADWASTE SYSTEM
TYPICAL LINER INTERNALS



NO.	QUANTITY	NAME	MATERIAL ^{7/2}
1	1	Liner	6 x 6: Ref. Epicor Dwg. #T-66000 4 x 4: Ref. JAS Dwg. #BL-62579
2	1	Underdrain System o Filter Media Cartridges o Pipe Header o Hose - Goodall Type	Cotton PVC
3	1	Distribution Header	Carbon Steel Pipe
4	3	Caps-Hansen Type Quick Disconnects	Carbon Steel
5	1	Level Probe - Air Bubbler	Carbon Steel
6	1	Level Probe - FAUA Engineering Capacitance Type-3E3B,4/Probes	Copper
7	1	Cap - Reset	Carbon Steel
8	1	Manhole - 55 Gallon Drum Cover Stock Equipment with 4" O.D. Bung	Carbon Steel