

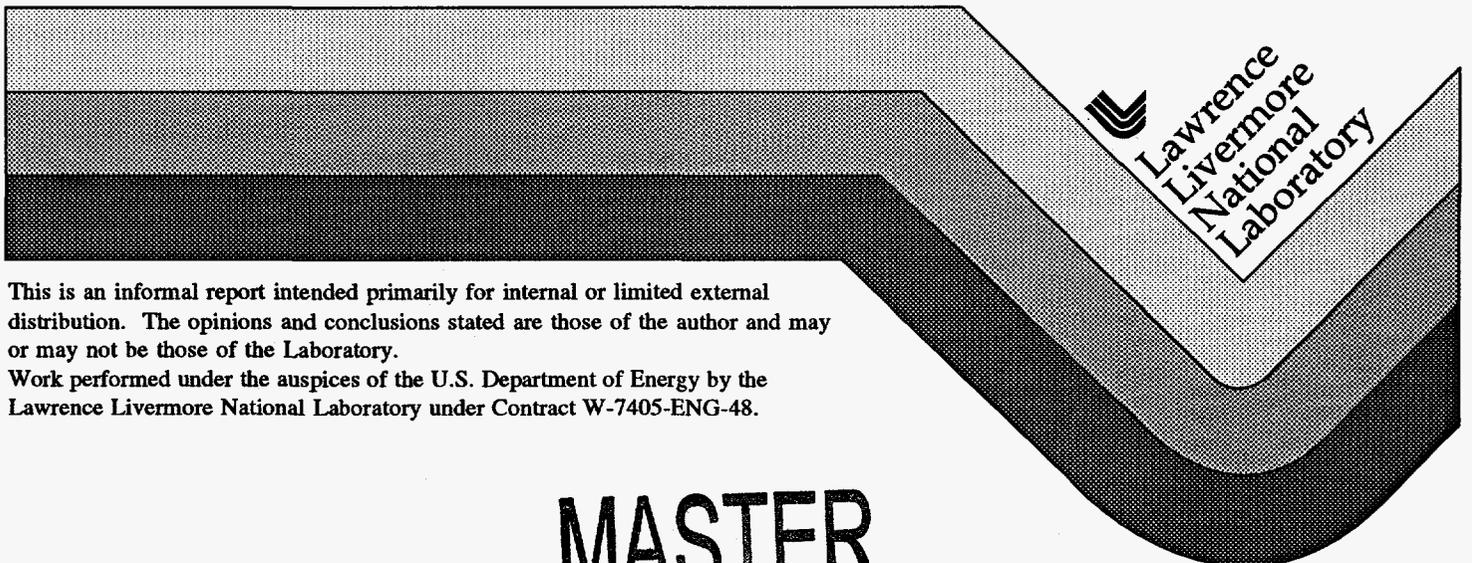
Health Chemistry Design Recommendations for Enclosed Firing Facility

C. L. Lindeken

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December 11, 1959



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December 11, 1958

**DECLASSIFICATION
STAMP ON REVERSE.**

MEMORANDUM

TO: B. W. Crowley

FROM: C. L. Lindeken

SUBJECT: Health Chemistry Design Recommendations for Enclosed Firing Facility

Health Chemistry has accepted either participating or prime interest responsibility in the following aspects pertaining to the subject facility:

1. Venting and ventilation
2. Entry and reentry systems
3. Contamination control
4. Material accountability

This memorandum transmits presently available information for your review and use in formulating design criteria for Holmes and Narver. Although contamination control and accountability are not individually discussed, contamination control is involved in both the first two points. Accountability will be handled by a separate procedure manual. We have discussed only those matters with which Holmes and Narver will be concerned from a design standpoint.

1. Venting and Ventilation

While some aspects of sphere venting and ventilation must await knowledge of radiochemical sampling and chemical processing procedures, we believe that we have an available filter which will perform satisfactorily under all presently anticipated conditions. The specifications are as follows:

Model	Cambridge 1F 1000
Filter medium	CM 115
Separators	Aluminum or asbestos
Sealer	Glass pack
Frame	Steel
Frame finish	Cadmium plate
Maximum continuous operating temperature	1000° F
Maximum prolonged relative humidity	100%
Capacity at 1.0" Δp	1000 cfm
Rupture pressure	8" W.G.

The temperature, humidity and rupture resistance of this filter should afford the necessary flexibility. The humidity resistance will be particularly important if live steam is introduced into the sphere to melt the ice.

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Classification (Date of Review) Changed to:

UNCLASSIFIED

(Insert appropriate classification level or indicate Unclassified)

This memorandum transmits a copy of the report to you for your review and use in formulating your response to the report. The report is classified "Confidential" and is to be controlled as such. The report is to be controlled as such. The report is to be controlled as such.

by authority of R2D2-1096/1122/3/95 (date)

by [Signature] (date)

verified by R. J. Barras 10/4/99 (date)

(Signature of person verifying this is the correct document or model)

1. Venting and Ventilation

While some aspects of sphere venting and ventilation must await knowledge of radiochemical sampling and chemical processing procedures, we believe that we have an available filter which will perform satisfactorily under all presently anticipated conditions. The specifications are as follows:

Cambridge 1F 1000	Model
OW 112	Filter medium
Aluminum or stainless	Separators
Glass wool	Coalescer
Steel	Frame
Galvanneal plate	Frame finish
	Maximum continuous operating temperature
1000° F	Maximum prolonged relative humidity
100%	Capacity at 1.0" dp
1000 cfm	Filter pressure
8" W.D.	

The temperature, humidity and rupture resistance of this filter should afford the necessary flexibility. The humidity resistance will be particularly important if live steam is introduced into the sphere to melt the ice.



This filter would be in the system at shot time. A flanged or heavily valved by-pass should be provided upstream to the surge tank to allow sufficient flow of ventilating air during post-shot ventilation. Another 1F 1000 filter would be required here also. A centrifugal air mover with a capacity of 1200-1500 cfm at 8.0" W.G. should be provided as a source of air movement.

2. Entry and Reentry Systems

After Chemical Processing has pumped out the solution from the sphere, Health Chemistry will be interested in ventilation and decontamination prior to reuse. Our present concept of this technique (see attached sketch) is somewhat as follows:

1. Unbelt the manhole cover (but not remove bolts).
2. Attach the plastic bag to base of manhole cover (note that temporary cover is inside the bag).
3. With overhead crane remove manhole cover and raise to a point above the sphere where fused capsule debris, if present, will clear sphere.
4. Place temporary cover over manhole.
5. Seal off bag containing manhole cover and debris and set aside for disposal.

Although we may have to use one or more of the auxiliary ports for the introduction of air, we propose to equip the temporary cover with plastic plumbing so as to provide for the insertion through this cover of a plastic pipe which can be raised or lowered to introduce filtered air (filtered so as to avoid blow-back or out-breathing) through the entire length of the sphere's vertical diameter. The discharge of this flow will be through a pipe larger but concentric with the nominal one-inch pressure relief pipe.

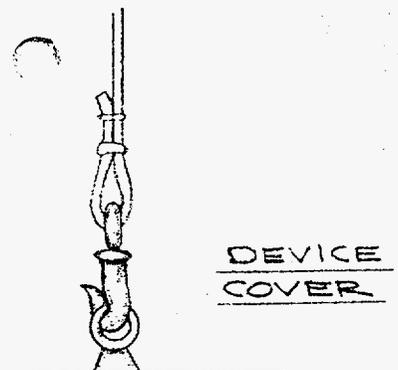
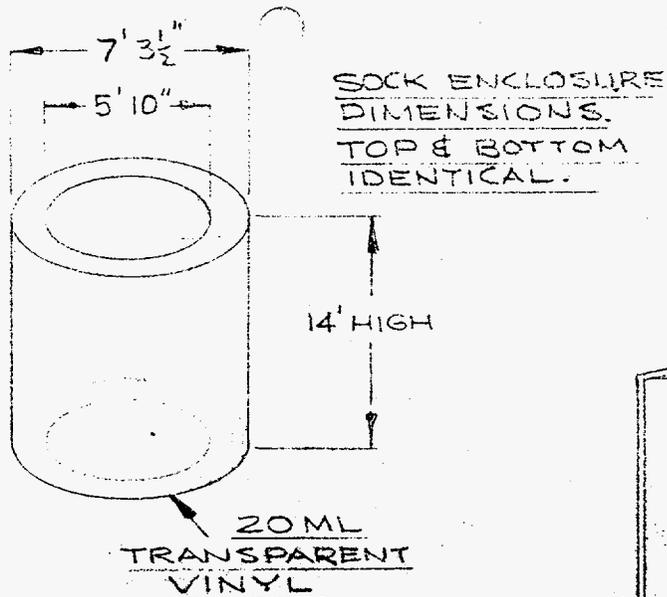
We also recognize the possibility of relatively large pieces of metal debris remaining in the bottom of the sphere after each shot. We will undertake the design and fabrication of a clamshell manipulator which can be supported by the overhead crane with manual but remote operative features for the removal of this material. If successful, this technique would probably be faster than introducing a suited up man into the sphere and would be superior both from a psychological and a radiological safety standpoint.

C. L. Lindeken
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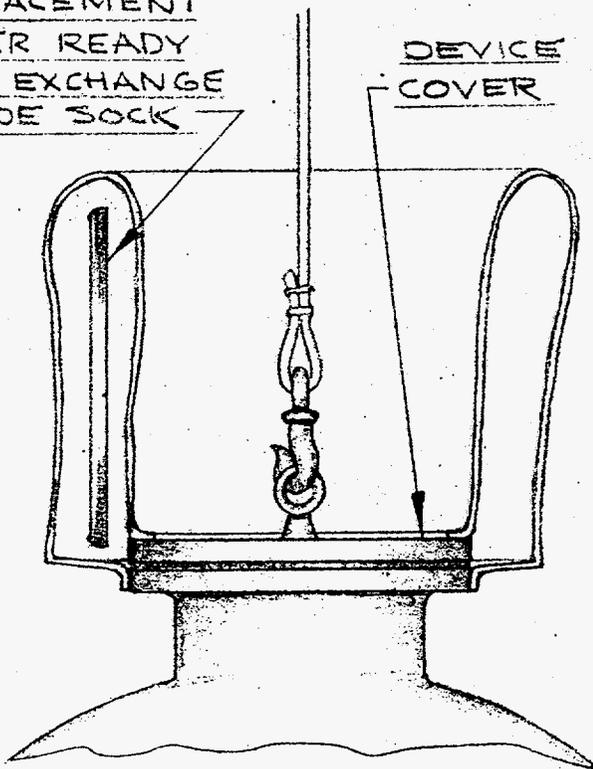
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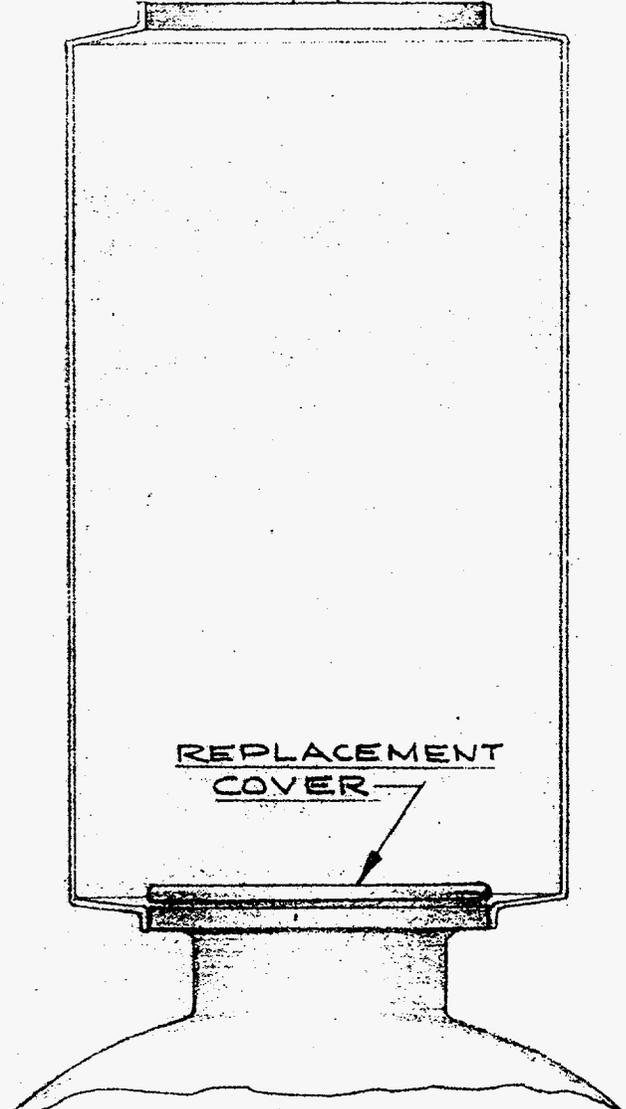
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REM
OLM/file



REPLACEMENT COVER READY FOR EXCHANGE INSIDE SOCK



CROSS SECTION OF VINYL SOCK ENCLOSURE INSTALLATION PRIOR TO EXCHANGE OF DEVICE MAN-HOLE COVERS.



CROSS SECTION OF VINYL SOCK ENCLOSURE POSITIONED FOR SEAL-OFF AFTER EXCHANGE OF DEVICE MAN-HOLE COVERS.

REPLACEMENT COVER TO BE CONSTRUCTED OF FIBER GLASS OVER ALUMINUM MESH.