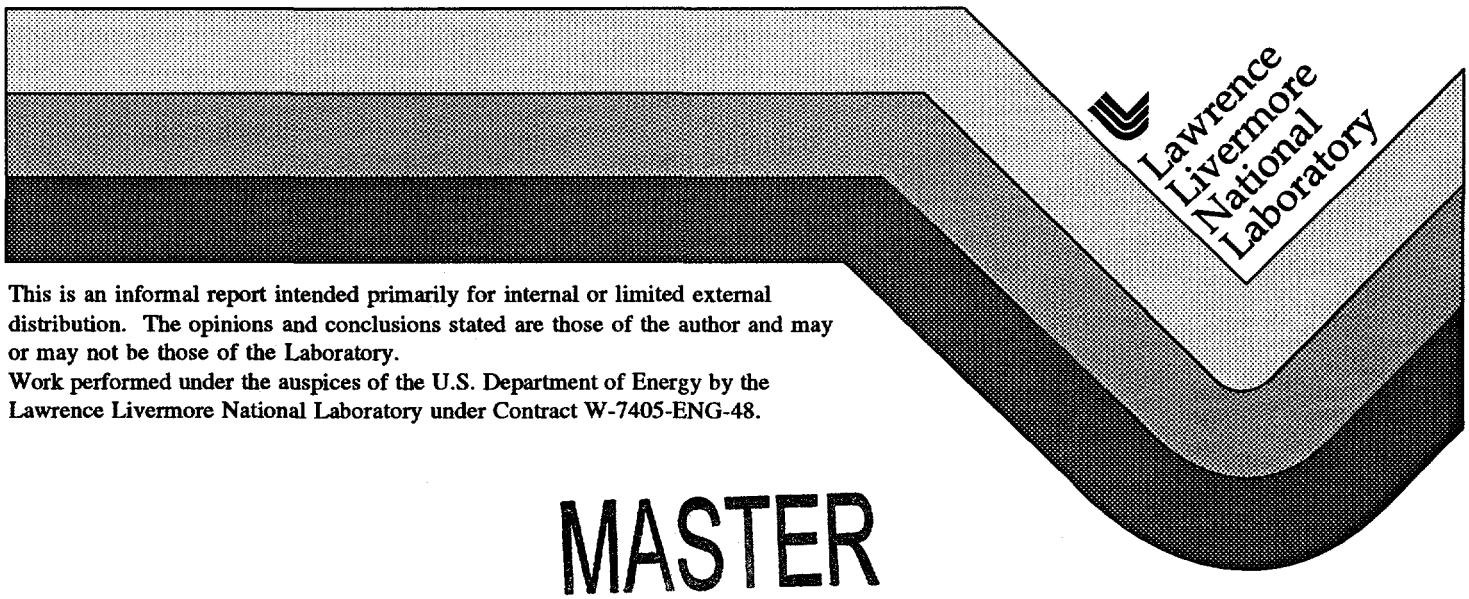
UCRL-ID-126680

Health Chemistry Design Recommendations for Enclosed Firing Facility

C. L. Lindeken

December 11, 1959



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DISCLAIMER

[redacted]

LIVERMORE: RADIATION LABORATORY
ROOM:1310 BLDG.:101

DECLASSIFICATION
STAMP ON REVERSE.

December 11, 1958

MEMORANDUM

TO: B. W. Crowley [redacted]

FROM: C. L. Lindeken

SUBJECT: Health Chemistry Design Recommendations for Enclosed Firing Facility

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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.

[redacted]

[redacted]

[illegible]

December 11, 1958

[redacted]

TO: A. [illegible] Crowley [redacted]

FROM: [illegible]

SUBJECT: Health Chemistry [illegible] Recommendations for Enclosed Firing Facility

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Classification (Declassification/Review Date) Changed to:
UNCLASSIFIED
(Insert appropriate classification level or indicate Unclassified)
by authority of RDD-10 [illegible] (date)
(Authority for change in classification, e.g., the memorandum number)
by [signature] 10/1/96 (date)
(Signature of person making the change)
verified by [signature] 10/4/96 (date)
(Signature of person verifing this is the correct document or model)

This memorandum transmits presently available information for your review and use in formulating [illegible] written by [illegible] Although contamination control and accountability [illegible] individually discussed, contamination control is [illegible] the first two points. Accountability will be handled by a separate [illegible] we have discussed only those matters with which Holmes and Narver will be concerned from a design standpoint.

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[redacted]

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. Unbolt 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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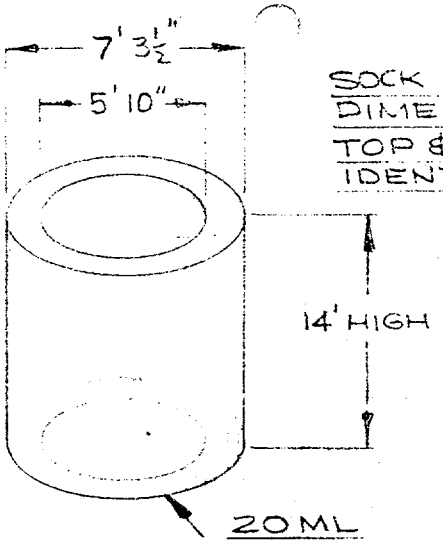
CLL/mz

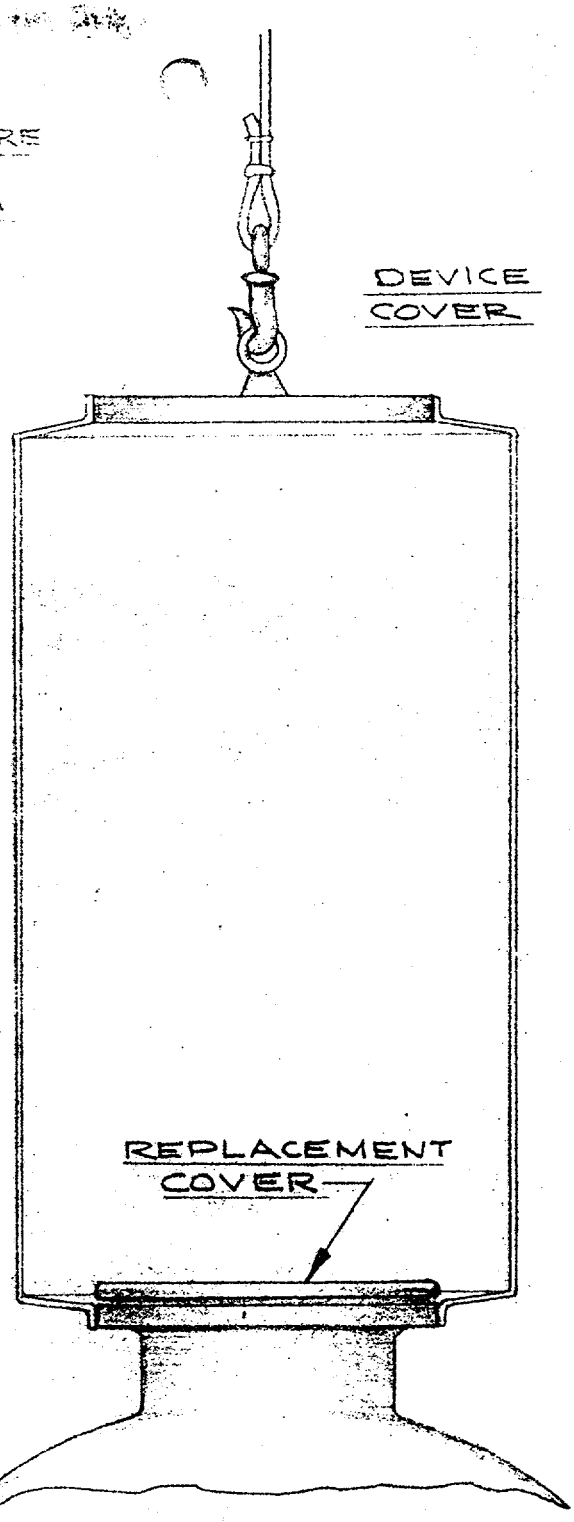
Encl.

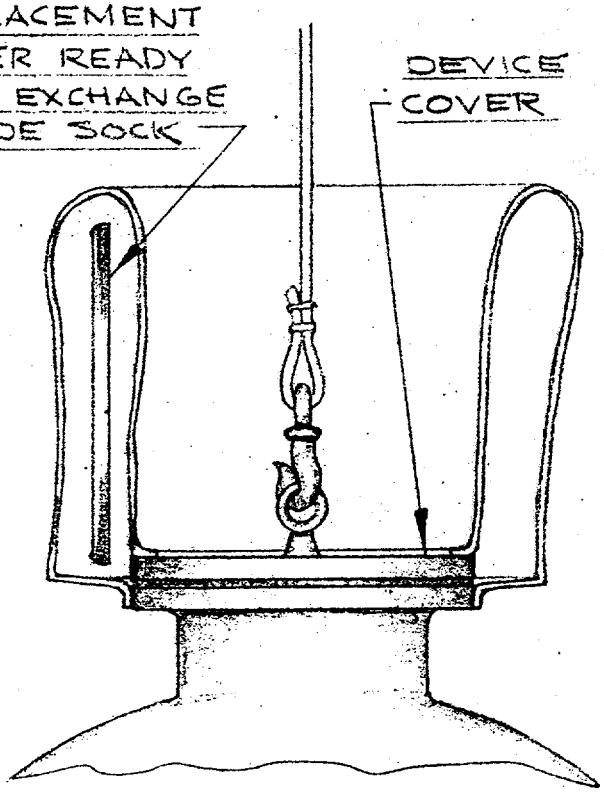
cc: JLM
REM
OLM/file

[redacted]



SOCK ENCLOSURE DIMENSIONS. TOP & BOTTOM IDENTICAL.





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.