

UCRL-ID-126680

Health Chemistry Design Recommendations for Enclosed Firing Facility

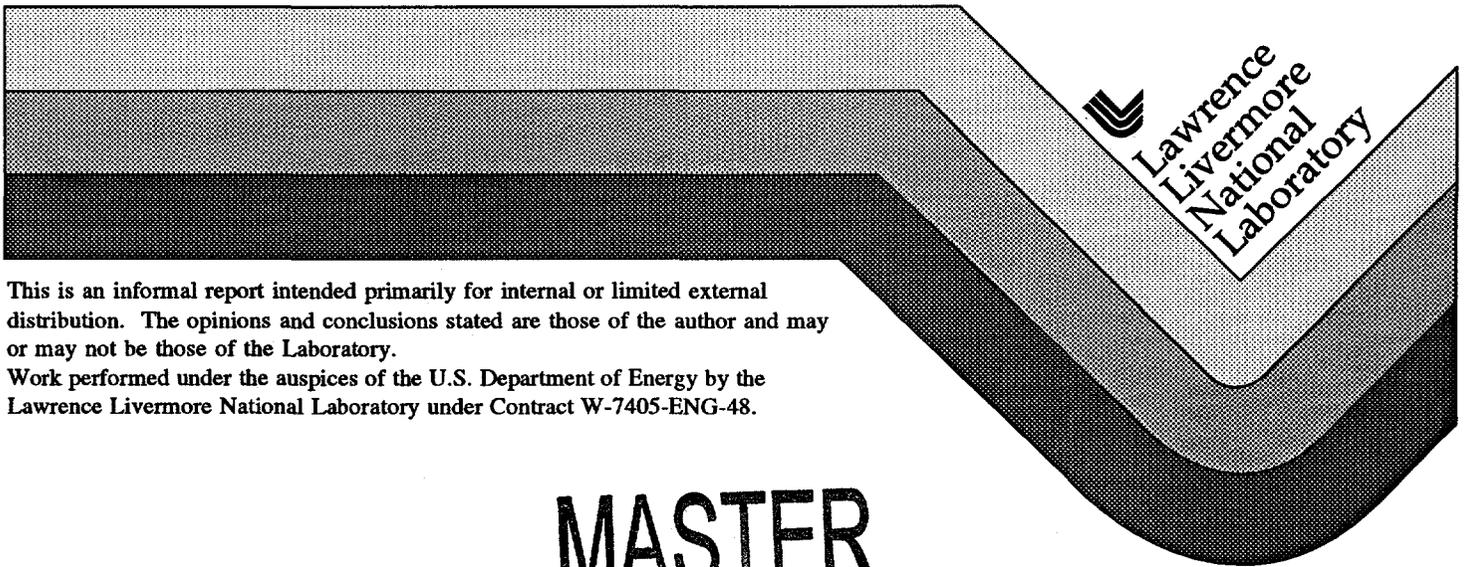
C. L. Lindeken

RECEIVED
APR 14 1997
OSTI

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

ph

December 11, 1959



This is an informal report intended primarily for internal or limited external distribution. The opinions and conclusions stated are those of the author and may or may not be those of the Laboratory.

Work performed under the auspices of the U.S. Department of Energy by the Lawrence Livermore National Laboratory under Contract W-7405-ENG-48.

MASTER

DISCLAIMER

This document was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor the University of California nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or the University of California, and shall not be used for advertising or product endorsement purposes.

This report has been reproduced
directly from the best available copy.

Available to DOE and DOE contractors from the
Office of Scientific and Technical Information
P.O. Box 62, Oak Ridge, TN 37831
Prices available from (615) 576-8401, FTS 626-8401

Available to the public from the
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Rd.,
Springfield, VA 22161

DISCLAIMER

**Portions of this document may be illegible
in electronic image products. Images are
produced from the best available original
document.**

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, make any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

**DECLASSIFICATION
STAMP ON REVERSE.**

December 11, 1958

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.

SECRET, IN ADDRESS

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

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

Classification (Date of Review) Changed to:

UNCLASSIFIED

(Insert appropriate classification level or indicate Unclassified)

This memorandum transmits the results of the review of the design and use in formal testing of the R7D2-10961122/3/95 (date) contamination control system. The review was conducted by the two persons listed below. The results of the review are discussed only in this memorandum and are not to be disseminated outside the design team.

verified by R. J. Barras 10/4/95 (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 14 1000	Model
CM 112	Filter medium
Aluminum or stainless	Separator
Glass back	Coiler
Steel	Frame
Galvanneal plate	Frame finish
1000° F	Maximum continuous operating temperature
1000	Maximum prolonged relative humidity
1000 cfm	Capacity at 1.0" dp
8" W.D.	Filter pressure

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.

-2-

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.

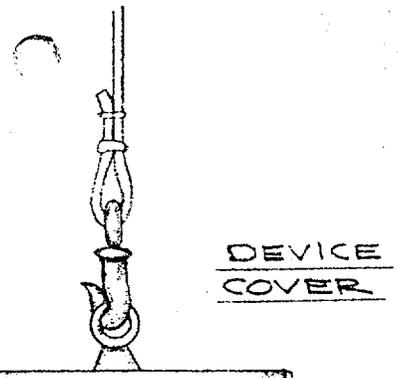
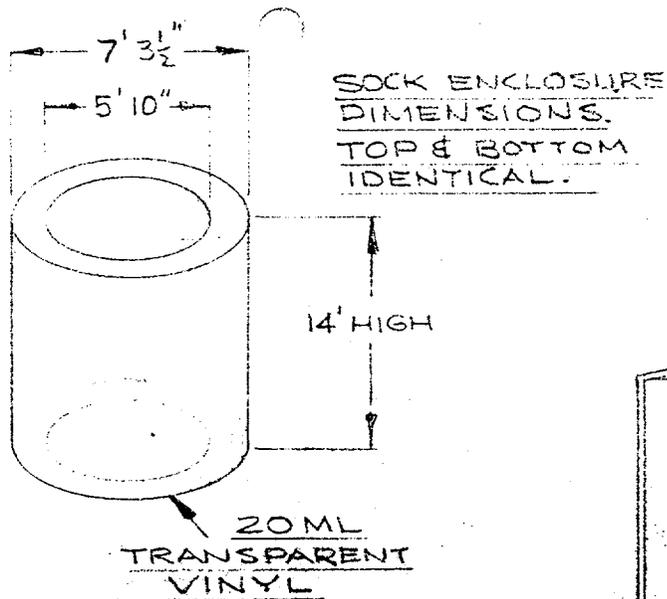

C. L. Lindeken

CLL/mz

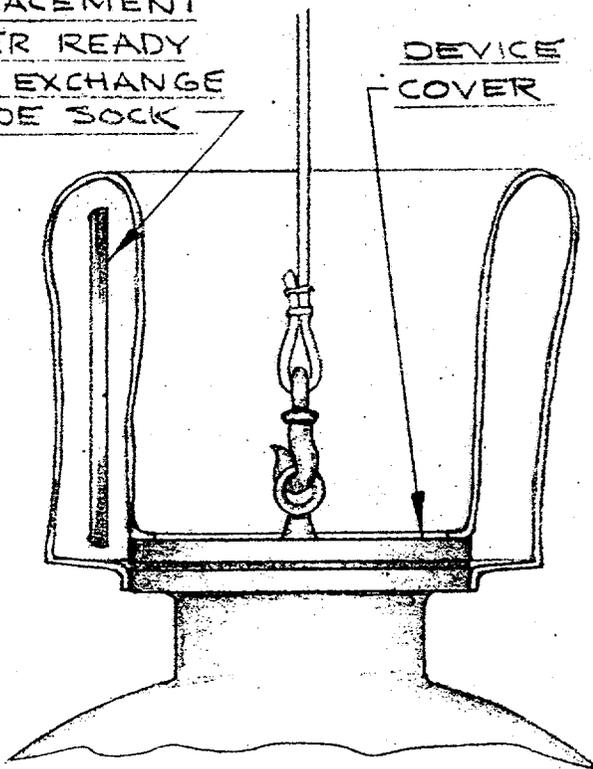
Encl.

cc: JLM
REM
OLM/file

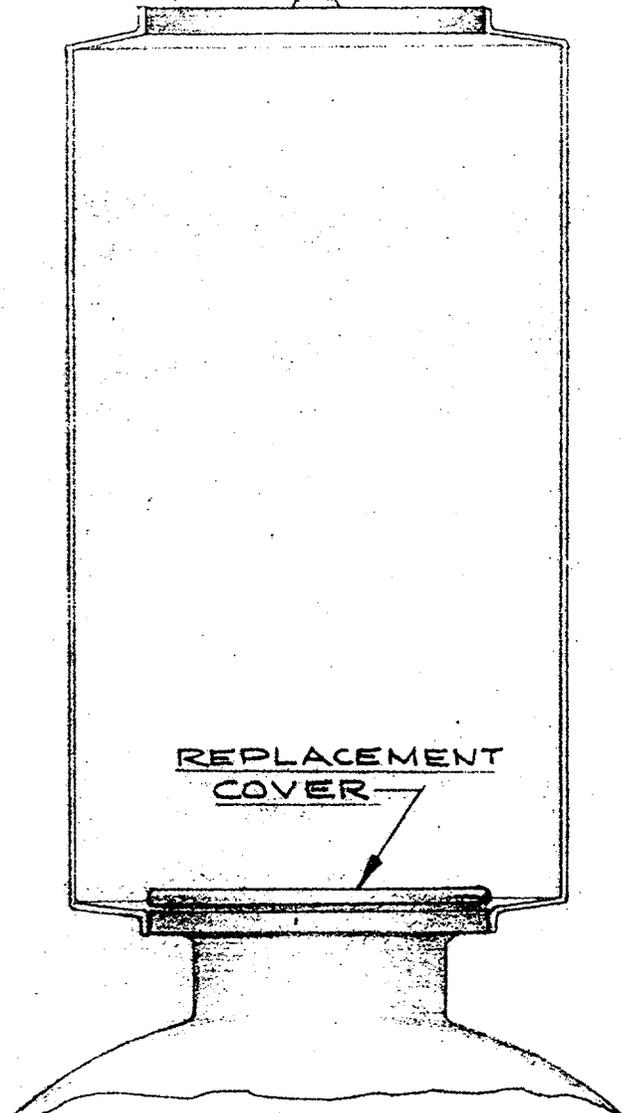




REPLACEMENT COVER READY FOR EXCHANGE INSIDE SOCK



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.