PIPING DECONTAMINATION PROCEDURE

Revision 1.0

Nobember 1, 1995

Purpose:

To Define The Procedure For Decontamination And Release of Pipe From Radiological Controlled Areas at The Harshaw Chemical Project Cleveland, Ohio.

Scope:

This Procedure Applies To All Employees Involved In Piping Decontamination at The Harshaw Chemical Project, Cleveland, Ohio.

Responsibilities:

Radiological Safety Officer - The Radiological Safety Officer (RSO) is responsible for establishing Release Criteria and implementing the statistical random sampling method for release of materials from the radiological controlled area. The RSO will review all survey methods and final survey data prior to the release of any materials from the radiological controlled areas. The RSO will establish levels of personnal protective equipment such that personnel will have adequate protection from radiological contamination as well as airborne contamination. The RSO will determine adequate decontamination methods to keep the spread of contamination As Low As Reasonably Achievable (ALARA).

Health Physics Technician (HPT) - The Health Physics Technicians are responsible for determining contamination levels of all pipe prior to decontamination. The HPT is responsible for implementing the statistical sampling method outlined by the RSO, and documenting all surveys of decontaminated material that meets the release criteria as established in Table 1.

Field Operations Lead (FOL) - The Field Operations Lead is responsible for the separation of all pipe by contamination level, pipe diameter and type of pipe (ie. process pipe, conduit, sprinkler system, drain pipe).

Laborers - Laborers will be responsible for decontamination of the piping in accordance with this procedure.

Definitions:

FOL - Field Operations Lead

HPT - Health Physics Technician

ALARA - As Low AS Reasonably Achievable

RSO - Radiological Safety Officer

CPM - Counts Per Minute

Description:

Pipe shall be removed from the building structure prior to decontamination. Upon removal the pipe shall be surveyed by the Health Physics Technician using a Ludlum Model 3/W HP-260 probe to determine the contamination levels. The ends of the pipe shall be taped shut to reduce the potential spread of contamination prior to the start of decontamination. Based upon the initial survey results all pipe shall be segregated into two categories.

A) < 10,000 cpm

B) > 10,000 cpm (Pipe shall be isolated from other piping.)

Pipe which is < 10,000 cpm shall be separated by general size (e.g. 0-2", 2-4", etc.). Before the start of decontamination pipe shall be further separated by type (e.g. process, conduit, water, sprinkler system). The pipe shall then be assigned into a lot and given a unique identification number.

The following approach is designed to allow for the cost-effective separation of pipe meeting the criteria for release for unrestricted use from other pipe, the disposition of pipe with internal contamination, and the identification of pipe that has been successfully decontaminated. The rationale for the methodology is as follows:

The statistical survey of internal surfaces is designated to be 90% sure that 90% of the internal surfaces of a set of pipes of similar origin are free of internal contamination.

The individual survey of the internal surfaces of a pipe argues that if there is no contamination on the internal surface on each end that there will not be any on the other internal surfaces of the pipe.

The statistical survey of the external surfaces of each individual pipe is designed to be 90% sure that 90% if the external surfaces of the pipe meet the release criteria for fixed contamination and better than a 75% assurance that 75% of the external surfaces meet the criteria for removable contamination.

The approach is outlined on attached flow diagram, figure 1. Descriptions of the actions associated with each action shown are given in the following paragraphs.

1. Start by dividing a batch of pipe/conduit into groups depending on the external count rates observed in a preliminary survey. One group should be those pipes with less than 10,000 cpm on their external surfaces. The other batch should be those with higher count rates.

2. Perform a statistical survey of the internal surfaces of each batch separately by selecting 22 ends randomly and untaping each of these ends. Take a 100 cm^2 swipe of the internal surface of the 22 open ends. If all 22 are less than 100 cpm over background disposition them as follows:

- For the batch reading less than 10,000 cpm - begin external survey.

- For the batch reading more than 10,000 cpm - consider decontaminating external surfaces.

3. If some of the 22 random swipes exceed the limit of 100 cpm over background perform a survey of individual internal surfaces. To do this untape the ends of each pipe and swipe the internal surfaces of each end. Disposition pipes with both ends under the limit as defined in Step 2. For pipes having contamination in excess of the limit in one or both ends dispose of as radioactive waste. No internal decontamination is planned.

4. Perform a statistical survey of the external surfaces of each pipe. Do this in two parts, one to consider the removable contamination, and one to consider the fixed contamination.

For the first part take a maslin cloth and wipe about two square feet of the surface of the pipe, to include areas along and around the pipe surface. Survey the approximately 100 cm^2 area of the maslin used. If the resulting count rate does not exceed 100 cpm above background consider the smearable activity to be below the limits (The average will be ten times below the limits) and begin the fixed contamination survey. If contamination is found slightly above the limits (100 to 300 cpm above background), take five 100 cm^2 swipes randomly from the surface of the pipe and count them. If all five of these are less than 100 cpm above background go ahead with the fixed contamination survey. If not, or if the count on the maslin exceeds 300 cpm above background, decontaminate the pipe, or consider it for re-decontamination.

For the second part, use a Lundlum 2221 with a pancake probe or equivalent instrument, i.e., which provides a digital readout every two seconds or so, and take a series of measurements of at least 22 in number - to include points along the length of the pipe as well as around the circumference of the pipe.

If all 22 of the Ludlum 2221 readings are less than 100 cpm over background and the removable (smearable) contamination is within limits (the maslin or the five smears meet the limits), document the results of the surveys and release the pipe for unrestricted use. If not, disposition the pipes as follows:

- For the batch readings less than 10,000 cpm - decontaminate external surfaces

- For the individual pipes already having been decontaminate - consider repeating the decontamination process.

5. **Document**

Complete a survey from for the surveys conducted in support of the release of this pipe or set of pipes. A polaroid picture of the material approved for release is an alternative way to complete the form without excessive drawing or description. The form should be signed by the technician and approved before the material is removed from the controlled area. Some marking should be affixed to the material, such as a tag denoting the released status.

6. **Release for Unrestricted use**

Once a set of material has been approved for release and the documentation completed, the material should be removed from the controlled area promptly. Traditionally, the materials should be removed in less than 24 hours. A time should be chosen and then practice should be made consistent with it. Once outside the controlled area, the material should be staged for shipment.

7. **Decontaminate**

Pipe having more than 10,000 cpm external contamination and pipe failing the external statistical survey should be moved to the decontamination area. Tape on the outside surfaces should be removed to access the covered external surfaces. The cleaning should be done using the technique planned, e.g., vacuum blasting, etc.. Once clean the material should be staged in a clean area for the external survey.

8. **Consider repeating the decontamination process**

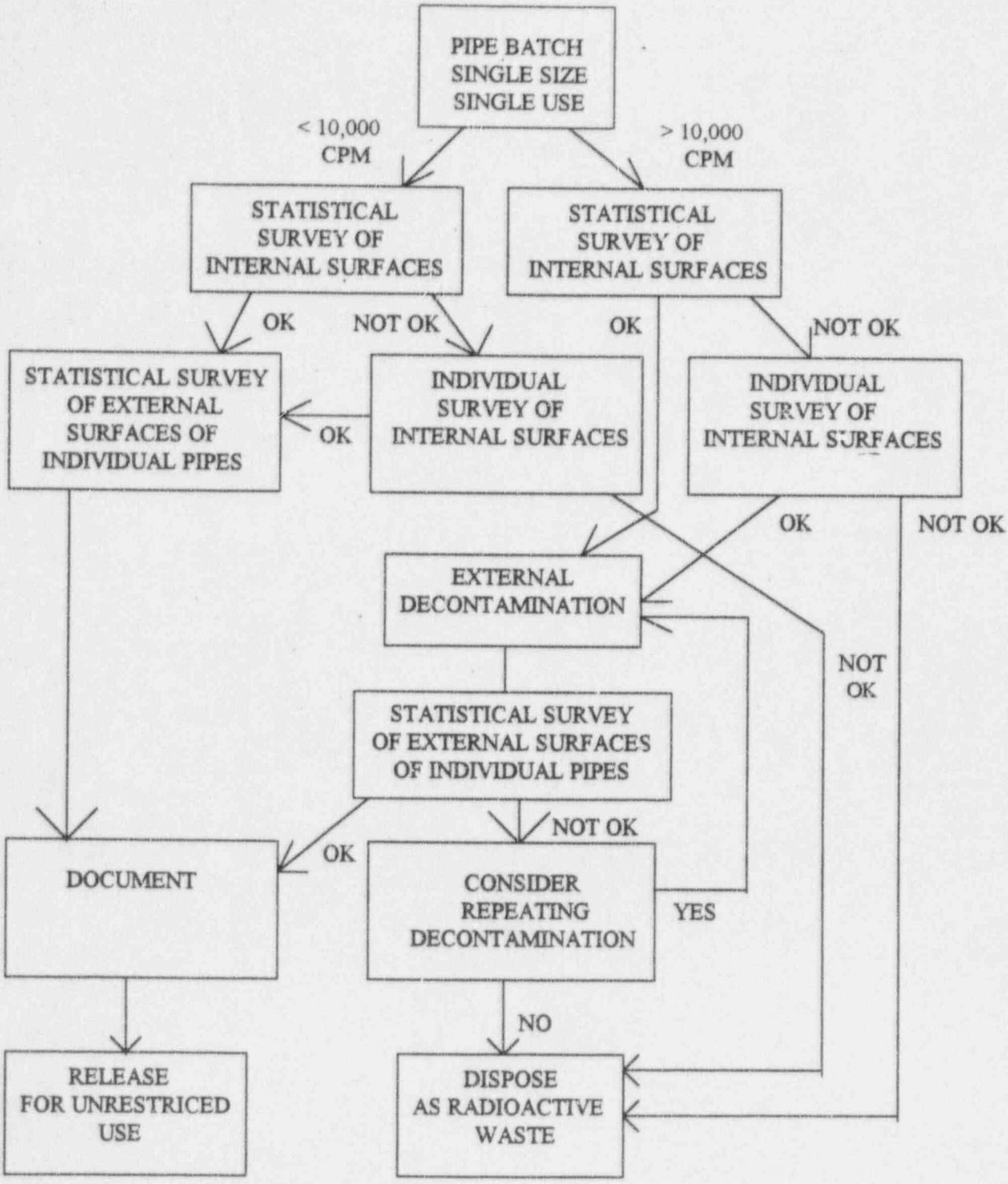
One may want to reconsider disposition of an item as radioactive waste even when it has failed to meet the requirements during the external survey. Pre-established guidance should be used for making this decision. Two possible conditions to be considered are the following:

- The amount of contamination present - If only a few of the 22 readings are high or if the high readings are only slightly over the limit.

- The size of the component - It is usually more beneficial to spend the extra time on larger components. Small pieces of small diameter pipe should not often be re-decontaminated.

9. **Dispose of as radioactive waste**

Materials with internal contamination, and materials with external contamination which have not been successfully decontaminated should be placed in B-25 boxes or roll-off containers as appropriate for disposition as radioactive waste.


PIPE BATCH
SINGLE SIZE
SINGLE USE
< 10,000
CPM
> 10,000
CPM
STATISTICAL
SURVEY OF
INTERNAL SURFACES
STATISTICAL
SURVEY OF
INTERNAL SURFACES
OK
NOT OK
OK
NOT OK
STATISTICAL SURVEY
OF EXTERNAL
SURFACES OF
INDIVIDUAL PIPES
OK
INDIVIDUAL
SURVEY OF
INTERNAL SURFACES
INDIVIDUAL
SURVEY OF
INTERNAL SURFACES
OK
NOT OK
EXTERNAL
DECONTAMINATION
NOT
OK
STATISTICAL SURVEY
OF EXTERNAL SURFACES
OF INDIVIDUAL PIPES
NOT OK
OK
DOCUMENT
CONSIDER
REPEATING
DECONTAMINATION
YES
NO
RELEASE
FOR UNRESTRICED
USE
DISPOSE
AS RADIOACTIVE
WASTE

FOSTER WHEELER ENVIRONMENTAL CORPORATION

November 15, 1995

Mr. William G. Snell
Senior Radiation Specialist
United States Nuclear Regulatory Commission
Region III
801 Warrenville Road
Lisle, IL 60532-4351

Re: 1000 Harvard Avenue, Cleveland, Ohio
Former Harshaw Chemical Plant "C"

Dear Mr. Snell,

Attached is a copy of the procedure Foster Wheeler Environmental Corporation will be using for verification of pipe decontamination at the Harshaw Chemical facility. The pipe will be decontaminated by vacuum blasting. A pilot study has been performed and this decontamination method was able to achieve levels well below the free release criteria identified in "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of License for Byproduct, Source or Special Nuclear Material", U.S. Nuclear Regulatory Division of Industrial and Medical Nuclear Safety Washington, D.C., August 1987.

Our intent is to begin pipe decontamination on November 20, 1995. Estimated completion date of pipe decontamination is January 17, 1996. If you have any questions regarding the Harshaw Chemical project in Cleveland, please feel free to contact our office.

Very sincerely yours,

Ferdinand Rock
Project Manager

cc: R. William Potter (Chevron Chemical Co.)
Joe Davis, III (Foster Wheeler)
Ken Eger (Foster Wheeler)
Project File

c/o Harshaw Chemical Company
1000 Harvard Avenue, P.O. Box 609359, Cleveland, OH 44109-9359
Tel.: 216-398-6064 Fax: 216-398-2127

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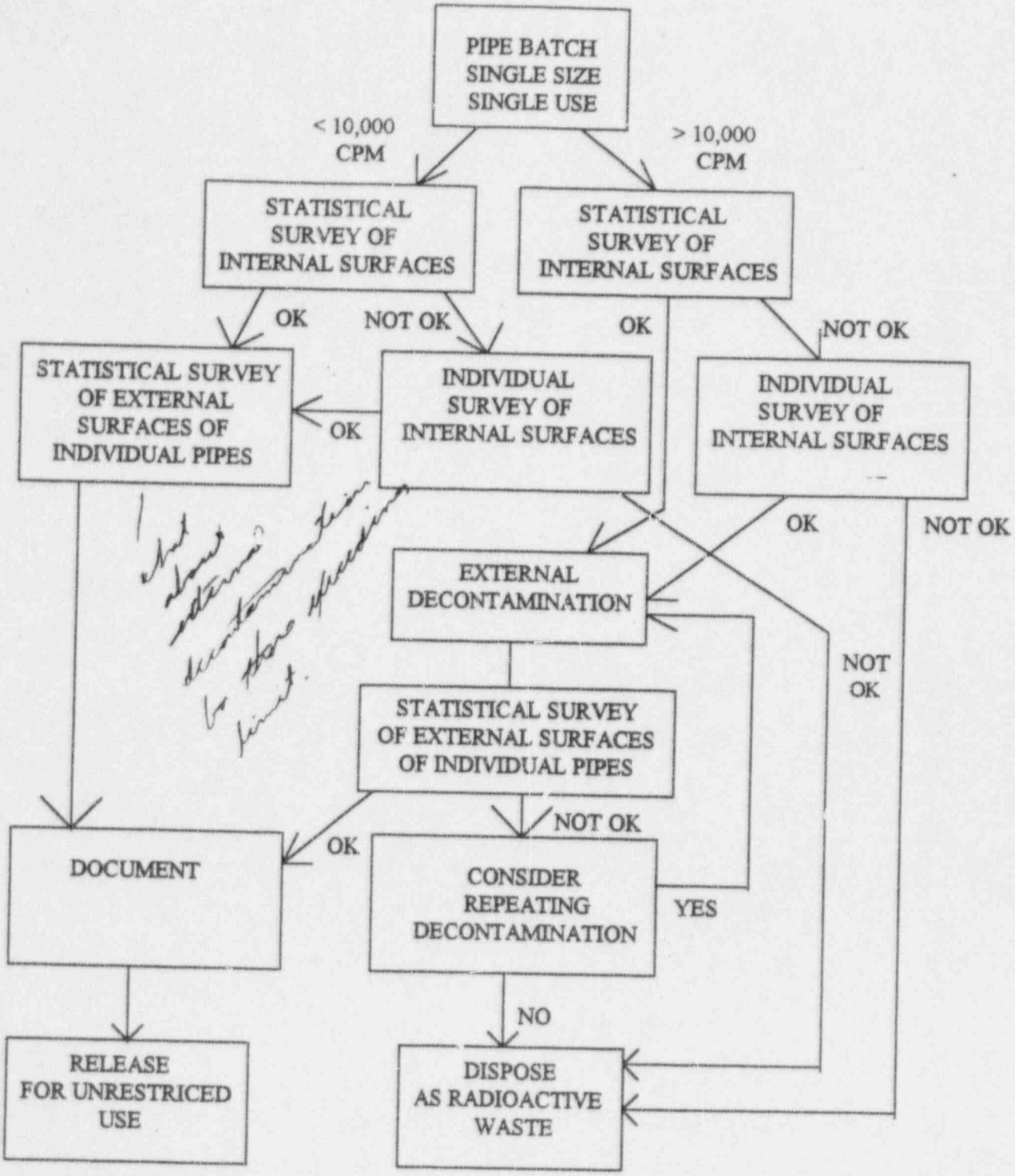
PIPE BATCH
SINGLE SIZE
SINGLE USE
< 10,000
CPM
> 10,000
CPM
STATISTICAL
SURVEY OF
INTERNAL SURFACES
STATISTICAL
SURVEY OF
INTERNAL SURFACES
OK
NOT OK
OK
NOT OK
STATISTICAL SURVEY
OF EXTERNAL
SURFACES OF
INDIVIDUAL PIPES
OK
INDIVIDUAL
SURVEY OF
INTERNAL SURFACES
INDIVIDUAL
SURVEY OF
INTERNAL SURFACES
OK
NOT OK
EXTERNAL
DECONTAMINATION
NOT
OK
STATISTICAL SURVEY
OF EXTERNAL SURFACES
OF INDIVIDUAL PIPES
NOT OK
OK
DOCUMENT
CONSIDER
REPEATING
DECONTAMINATION
YES
NO
RELEASE
FOR UNRESTRICED
USE
DISPOSE
AS RADIOACTIVE
WASTE