UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA ST., N.W., SUITE 3100
ATLANTA, GEORGIA 30303

In Reply Refer To:
RII:JPO

RICHMOND ENGINEERING COMPANY INC.
7TH AND HOSPITAL STREETS
RICHMOND VA 23223
NRC LIC. #: 45-02884-01

Gentlemen:

The enclosed Bulletin 80-22 is sent to you for action. If there are any questions related to the requested actions, please contact this office.

Sincerely,

James P. O'Reilly
Director

Enclosures:
1. IE Bulletin No. 80-22 w/encl
2. List of Recently issued IE Bulletins

SSINS No: 6820
Accession No.:
8006190050
IEB 80-22

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

September 11, 1980

IE Bulletin No. 80-22: AUTOMATION INDUSTRIES, MODEL 200-520-008 SEALED-SOURCE CONNECTORS

Description of Circumstances:

An accident recently occurred in the State of California (an Agreement State) that resulted in several serious overexposures (see enclosed Circular 79-16). The accident involved the use of an Automation Industries (AI) Model 200-520-008 source pigtail to drive cable connection. The connector is identified by the manufacturer as its "quick disconnect" type of connector and is used with several models of cobalt-60 and iridium-192 source assemblies distributed by the manufacturer. The connection is a simple hook and eye connection (see Fig. 1) that will permit separation of the eye from the hook when they are oriented at right angles to each other without any further positive action. As a result of the design, a disconnection may occur any time the source assembly is cranked out of the exposure device without the guide tube being attached. Since the Automation Industries Model 200-520-008 sealed-source assembly is authorized to contain up to 120 curies of iridium-192, a source disconnection creates a potential for a serious exposure.

A disconnect is very unlikely to occur if proper procedures are followed by users of Automation Industries sealed sources containing the "quick disconnect". However, due to the large number of overexposures that occur in the radiography industry due to the failure to follow proper procedures, the NRC has determined that continued use of the Automation Industries "quick disconnect" connector with its Model 200-520-008 sealed-source assembly or other assemblies can constitute a hazard to the public health, safety or interest.

As a result, the NRC has ordered Automation Industries to discontinue distribution of the AI Model 200-520-008 sealed-source assembly or any other sealed-source assembly that uses the "quick disconnect" type of connector. Additionally, the NRC will not accept new applications for authorization to use the AI Model 200-520-008 or other sealed-source assemblies using the "quick disconnect". In effect, this will remove such iridium-192 source and pigtail assemblies from service as licensees exchange their diminished activity sources. Special arrangements should be made for removing from service, those connectors that are attached to longer lived sources such as cobalt-60.

The removal from service of the "quick disconnect" type of connector will require that those drive cables having the matching open hook connector be modified.

Actions To Be Taken by Licensees

To assure the safe operation of radiography equipment in which the AI "quick disconnect" connector is used, all licensees authorized to use byproduct materials under 10 CFR Part 34 shall perform the following:

(1) Determine the number of AI Model 200-520-008 and other assemblies in your inventory that have the "quick disconnect" connector and establish a disposal schedule. Your schedule for iridium-192 sources should be no longer than your usual exchange schedule for diminished activity sources. Your exchange schedule for connector modification for cobalt-60 sources should be accomplished as soon as is conveniently possible. However, you should complete your disposal or modification by September 1, 1981.

(2) In the interim, a warning mark or tag should be placed on each radiographic device in which AI "quick disconnect" type assemblies are being used.

(3) This matter should be reviewed with all radiographers. They should be cautioned of the disconnect possibility and be informed of the method used to identify equipment as marked in accordance with Item (2) above.

(4) Review and modify operating, maintenance, inspection and handling procedures as appropriate to preclude this type of accidental disconnect.

NOTE: You may want to contact the manufacturer for assistance in determining appropriate procedural changes or fixes to preclude a disconnect.

(5) Discuss with the radiographers the importance of making adequate surveys and the need for following procedures.

A report of your actions for each of the above numbered items shall be submitted to the director of the appropriate regional office within 30 days from the date of this Bulletin. A copy of the report shall also be sent to the Director, Division of Fuel Facility and Materials Safety Inspection, Office of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

Approved by GAO, B180225 (R0072); approval expired July 31, 1980. (Application for renewal pending before GAO). Approval was given under a blanket clearance specifically for identified generic problems.

Enclosures:
1. IE Circular No. 79-16
2. Figure 1

Accessions No.
7908020542
SSINS:6830

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

August 16, 1979

IE Circular No. 79-16

EXCESSIVE RADIATION EXPOSURES TO MEMBERS OF THE GENERAL PUBLIC AND A RADIOGRAPHER

Description of Circumstances:

During radiographic operations using 40 curies of iridium-192, the source became disconnected unbeknownst to the radiographer--he did not use his survey instrument. After the radiographer left the facility, an employee of the customer for which radiography was performed, saw the source and, not knowing what it was, picked it up and placed it in his hip pocket. He carried it about for approximately two hours, later giving it to his supervisor to examine. While making a determination that it was something which belonged to the radiographer, and while waiting for the radiographer to pick up the source, nine employees of the radiographer's customer were exposed. The source was also left with a secretary who was instructed to contact the radiographer. The radiographer returned, examined and took the source assurring the customer's employees that there was no problem, stating that the source was a "detector".

On the evening of the event, the employee who had put the source in his pocket became nauseous and went to a hospital for treatment. At that time a blister was found on his buttock. The initial diagnosis and treatment was for an insect bite. Thirty one days after this initial treatment the individual was hospitalized for treatment of the injury to his buttock. At that time the individual asked the physicians if there could be any connection of the injury to the radiography that had been performed at his place of work one month previously. An investigation followed which disclosed the above information.

The individual who had carried the source in his pocket remains under medical care following surgery. The attending physician does not consider the exposure to be life threatening. Neither does amputation appear necessary. The localized dose is estimated to be 1.5 million rem at skin surface, 60,000 rem at 1 cm depth and 7,000 rem at 3 cm depth. Estimated whole body doses to other individuals ranged from 1 to 60 rem. Hand doses ranged to 5,000 rem. The radiographer received estimated doses of 14 rem to the whole body and 50 rem to the hands.

These are serious radiation overexposures. However, another important aspect of the case, second only to the physiological effects of the exposures, is the radiographer's apparent disregard for the health and safety of the exposed individuals and for his own personal safety. The radiographer's failure to inform the involved individuals and to report the event to responsible management within his own and the customer's company is a serious disregard for safety and denied the exposed individuals early medical attention.

The primary cause of this incident was the failure to perform a radiation survey, a common underlying cause in radiation overexposures in the radiography industry. The number of radiation overexposures experienced in the radiography industry over the past several years has been higher than for any other single group of NRC licensees. To inform radiography licensees of NRC's concern for these recurring overexposure incidents, NRC staff representatives met with licensees in a series of five regional meetings during the period December 1977 throught March 1978. The main purposes of the meetings were to express NRC's concern for the high incidence of overexposures, and to open a line of communication between the NRC and radiography licensees in an effort to achieve the common goal of improved radiation safety. A written summary of those meetings was published by the NRC in NUREG-0495, "Public Meeting on Radiation Safety for Industrial Radiographers". A copy of that document was mailed to each NRC radiography licensee and to other companies which sent representatives to the meetings.

The remarks presented by the staff and subjects discussed at those meetings included, among others, ways and means of incorporating safety into radiography operations, and case histories of overexposure incidents, with highlights of the causes and possible preventions. In a discussion of the causes of overexposures, a presentation of statistics at the meetings showed that the failure of the radiographers to perform a radiation survey after each radiographic exposure was by far the most prevalent cause. While these surveys are required by regulation in 10 CFR 34.43(b), they are also the most basic, fundamental and common-sense thing to do when dealing with radiation levels inherent in a typical radiography operation. Failure to perform the surveys indicates a lack of training intensive enough to permanently instill in radiographers the extreme importance of surveys for protection of both themselves and other people. Some of the case histories discussed in NUREG-0495 resulted in painful radiation injury to hands and fingers, with eventual loss of one or more fingers in some cases.

Notice to Radiography Licensees:

NRC licensees authorized to use byproduct material under 10 CFR Part 34 are requested to take the following actions:

1. Review the event described in this Circular (and the other case histories in NUREG-0495) with all of your radiographic personnel at an early date; discuss and emphasize:

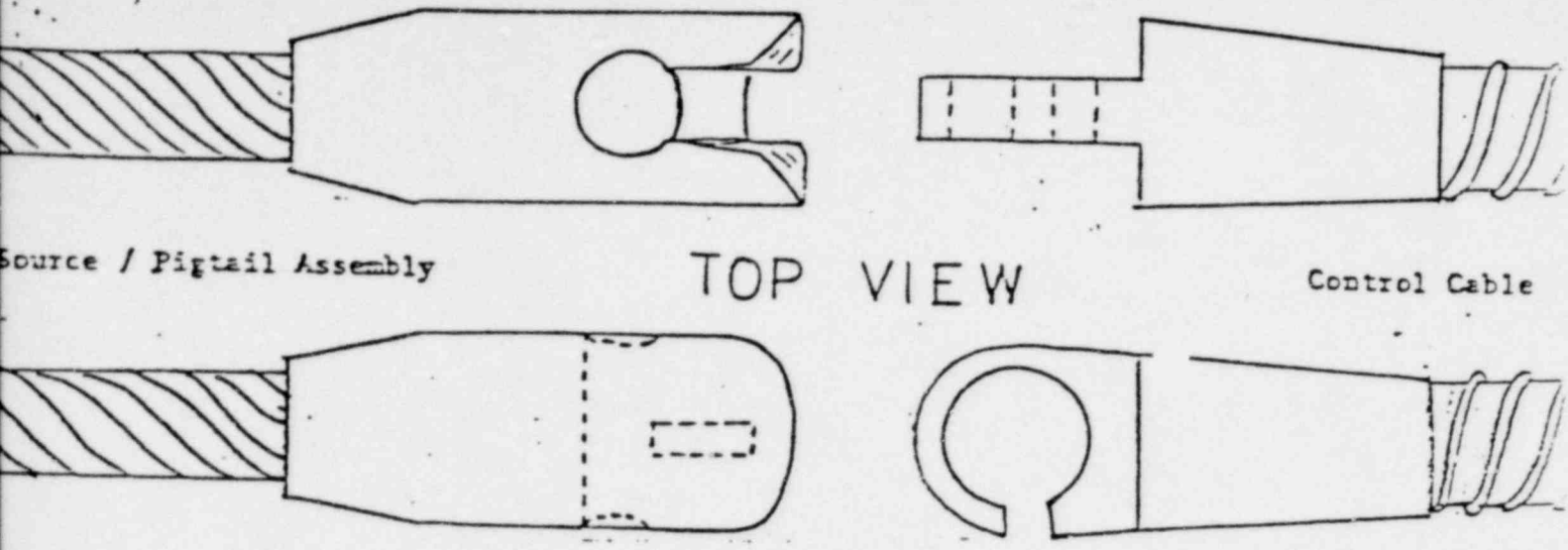
   a. the extreme importance of radiation surveys in assuring protection of themselves and of other people, and

   b. the importance of reporting promptly any unusual events or circumstances to responsible management.

2. Review your training to assure that appropriate emphasis is placed on the subjects in item 1 in both initial and refresher training courses.

3. Review your internal audit program to assure that appropriate emphasis is placed on these same subjects, particularly the requirement for auditors to observe radiographic operations to assure the proper conduct of radiation surveys.

No written response to this Circular is required. If you need additional information regarding this subject, please contact the Director of the appropriate NRC Regional Office.


Source / Pigtail Assembly
TOP VIEW
Control Cable

SIDE VIEW

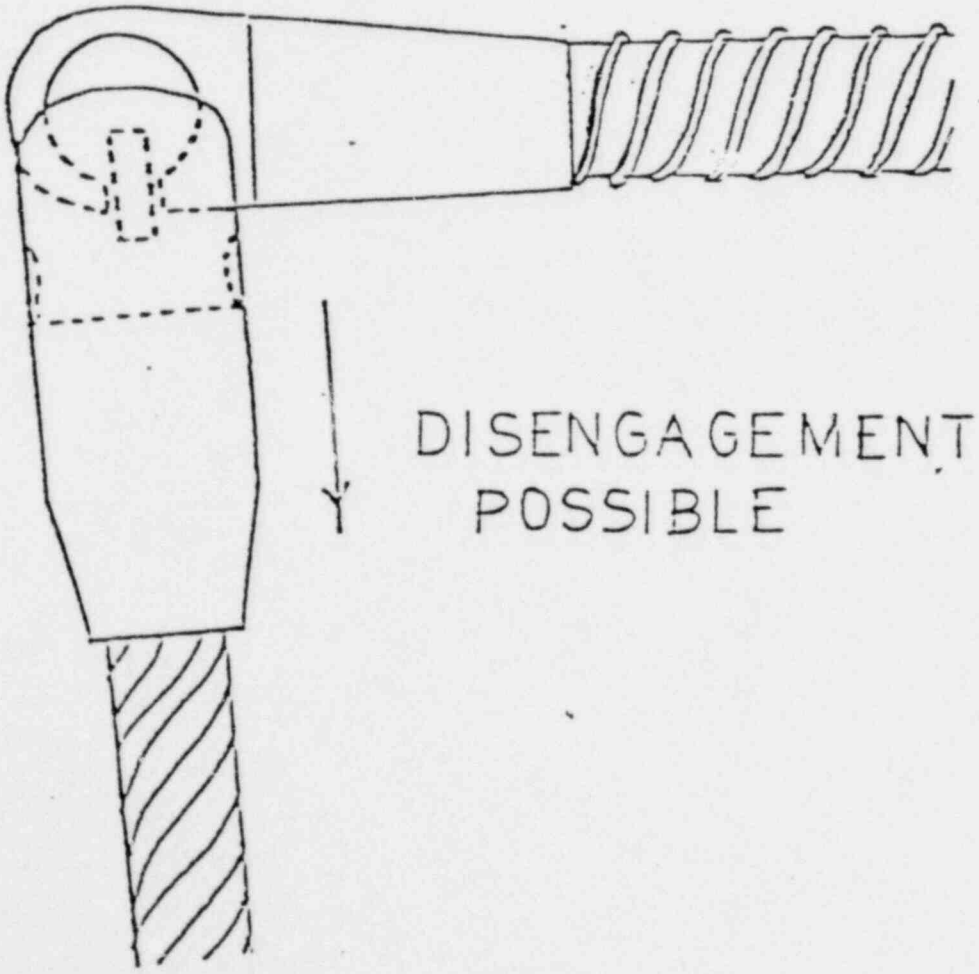

DISENGAGEMENT
POSSIBLE

FIGURE 4

RECENTLY ISSUED
IE BULLETINS

Bulletin No.	Subject	Date Issued	Issued To
80-22	Automation Industries, Model 200-520-008 Sealed-Source Connectors	9/11/80	All radiography licensees
79-26 Revision 1	Boron loss from BWR control blades	8/29/80	All BWR power facilities with an OL
80-20	Failures of Westinghouse Type W-2 Spring Return to Neutral Control Switches	7/31/80	To each nuclear power facility in your region having an OL or a CP
80-19	Failures of Mercury-Wetted Matrix Relays in Reactor Protective Systems of Operating Nuclear Power Plants Designed by Combustion Engineering	7/31/80	All nuclear power facilities having either an OL or a CP
80-18	Maintenance of Adequate Minimum Flow Thru Centrifugal Charging Pumps Following Secondary Side High Energy Line Rupture	7/24/80	All PWR power reactor facilities holding OLs and to those PWRs nearing licensing
Supplement 2 to 80-17	Failures Revealed by Testing Subsequent to Failure of Control Rods to Insert During a Scram at a BWR	7/22/80	All BWR power reactor facilities holding OLs
Supplement 1 to 80-17	Failure of Control Rods to Insert During a Scram at a BWR	7/18/80	All BWR power reactor facilities holding OLs
80-17	Failure of Control Rods to Insert During a Scram at a BWR	7/3/80	All BWR power reactor facilities holding OLs
80-16	Potential Misapplication of Rosemount Inc., Models 1151 and 1152 Pressure Transmitters with Either "A" or "D" Output Codes	6/27/80	All Power Reactor Facilities with an OL or a CP
80-15	Possible Loss Of Hotline With Loss Of Off-Site Power	6/18/80	All nuclear facilities holding OLs