

JOINT COMPANY/UNION SAFETY COMMITTEE CONCERN FORM

(Use Black Ink Only & Retain Copy For Your Records)

Mail: JCUSC, T690G

Case No. 90-012

EMPLOYEE NAME [REDACTED] EMPLOYEE NUMBER [REDACTED]

DEPARTMENT PMO BLDG. 334 PHONE [REDACTED] SHIFT 1

SUPERVISOR (Print) BUD CHAPMAN SUPV. EXT. 2720

DIRECT REPORT MANAGER (Print) KEN FRIEBERG MANAGER EXT. 2372

I have previously discussed this Concern with Supervision: Yes No.

Concern (briefly) POSSIBLE CROSS CONNECTIONS BETWEEN AIR BORN RADIO ACTIVE CONTAMINATION AND DOMESTIC WATER SYSTEM THROUGH UNPROTECTED EMERGENCY SHOWER AND EYE BATH FIXTURE IN RADIO ACTIVE CONTROLLED AREA.
(THIS SAFETY CONCERN SHOULD HAVE IMMEDIATE ACTION)

[REDACTED]
Employee Signature

1-11-90
Date

[Signature]
Steward Signature

1-11-90
Date

Supervision Response (within 5 working days) _____

Supervision Signature _____ Date _____

Direct Report Manager Signature _____ Date _____

NOTE: TIMELINESS IN COMPLETING THIS FORM IS OF THE UTMOST IMPORTANCE.

_____ I am satisfied with the results. _____ I am not satisfied.

Brief reason if not satisfied: _____

Employee Signature _____ Date _____

JCUSC received Safety Concern on: _____

To be completed by the JCUSC Co-Chairperson(s)

Assigned to: Union: Steve Leonard Date 1-11-90

Company: Ken Tietelberg Date 1-11-90

Distribution: Safety Committee (White)
Union Steward (Green)
Employee (Goldenrod)



JOINT COMPANY - UNION SAFETY COMMITTEE

December 19, 1990

To: [REDACTED]
PMO
Building 334
Ext. [REDACTED]

From: E. I. Tietenberg / S. Cordova
Co-Chairmen JCUSC
T-452-B / T-690-G
Ext. 7620 / Ext. 5800

RE: CLOSE-OUT OF SAFETY CONCERN NUMBER 90-012 / POSSIBLE CROSS CONTAMINATION

Facilities Engineering has completed evaluation of the backflow preventers on the plantsite, and has identified actions to be performed in a letter to R. M. Nelson, Jr., DOE, from J. A. Kirkebo, EG&G, subject: Colorado Health Department Request For Cross Connection Control Survey, dated December 6, 1990 (attachment 1).

The actions listed in the letter we believe address your concerns pertaining to the back flow preventers. The JCUSC will turn the tracking of this concern over to Performance Assurance, where it will be incorporated into the Integrated Safety Program.

Thank you for your participation in the safety program. If you have any further problems with this concern, it's answer, or implementation, please feel free to contact the Joint Company/Union Safety Committee.

E. I. Tietenberg
Company Safety Co-Chairman

S. Cordova
Union Safety Co-Chairman

cc:
G. G. Balint
A. H. Burlingame
B. Chapman
B. M. Clausen
R. C. Cordova
K. J. Freiberg
J. R. Marschall

c190-012.et

20 RF 4958

EG&G ROCKY FLATS

EG&G ROCKY FLATS, INC.
ROCKY FLATS PLANT, P.O. BOX 464, GOLDEN, COLORADO 80402-0464 • (303) 966-7000

DIST.	LTR
ALLHOFF, F.H.	
BRETZKE, J.C.	
BURLINGAME, A.H.	X
CROUCHER, D.W.	
DAVIS, J.G.	
EVERED, J.E.	
FERRERA, D.W.	
FERRERA, K.P.	
FERRIS, L.R.	
FRAIKOR, F.J.	
FRANCIS, G.E.	
GOODWIN, R.	
HEALY, T.J.	
IDEKER, E.H.	
JENS, J.P.	
KERSH, J.M.	
KIRBY, W.A.	
KIRKEBO, J.A.	X
LEE, E.M.	
MAJESTIC, J.B.	
MCDANIEL, M.G.	
MEURRENS, B.E.	
MONTROSS, R.W.	
MORGAN, R.V.	
NORTH, P.	
PALMER, L.A.	
PARNELL, R.F.	
POTTER, G.I.	
PIZZUTO, V.M.	
RHOADES, M.	
SAFFELL, B.F.	
SHANNON, W.M.	
SWANSON, E.R.	
WIEBE, J.S.	
WILKINSON, R.B.	
WILSON, J.M.	
YOUNG, E.R.	
ZANE, J.O.	X
A. Egan	X
Re Richards	X
V. ...	X
John ...	X

December 6, 1990

90-RF-4958

Robert M. Nelson, Jr.
Manager
DOE, RFO

COLORADO HEALTH DEPARTMENT REQUEST FOR RESULTS OF THE CROSS CONNECTION CONTROL SURVEY (10576)

- Refs: (a) R. M. Nelson memorandum WMED:AB:10576 to J. O. Zane, Colorado Health Department Request for Results of the Cross-Connection Control Survey, December 3, 1990
- (b) D. W. Ferrera ltr to R. M. Nelson, 90-RF-1936, Potential Cross-Connection in Building 774, May 4, 1990

PURPOSE:

The purpose of this letter is to provide you with the information requested in the December 3, 1990 letter referenced above.

BACKGROUND:

The cross connection control or backflow preventer (BFP) issue was originally addressed in reference (b). That letter provided a description of an incident involving a BFP in Building 774 and presented a plan and schedule on measures being taken to prevent cross connections at the plantsite. It was in response to the Colorado Department of Health (CDH) request for this information. This letter covers only the issue dealing with plantwide cross connection controls, as requested in reference (a).

DISCUSSION

The detailed information requested by DOE in their December 3, 1990 letter is presented in Attachments A through G. Specifically, Items 1 through 6 in the DOE letter are covered in Attachment A. An additional item (No. 7) was included to respond to the risk to workers issue. Furthermore, EG&G Rocky Flats, Inc. will provide a monthly status report, starting January 1, 1991, showing progress of the cross connection control program.

In summary, although much has been accomplished, such as completion of survey of all BFPs, field verification of deficient BFPs, and field work on overall domestic water evaluation of Pu facilities, the overall effort has fallen behind the original schedule. A new schedule (Attachment B) is presented for your information. It incorporates lessons learned from work done in the Pu facilities and represents a more realistic effort required to perform the planned tasks.

CORRES CONTROL
TRAFFIC

CLASSIFICATION:

UCNI	
UNCLASSIFIED	<input checked="" type="checkbox"/>
CONFIDENTIAL	
SECRET	

AUTHORIZED CLASSIFIER
SIGNATURE
R.M. Nelson
DATE
12/16/90

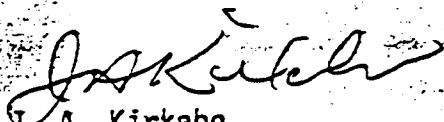
IN REPLY TO LTR NO.

PC# 1-024
LTR APPROVALS:
L. ...
ORIG & TYPIST INITIALS

R. M. Nelson, Jr.
December 6, 1990
90-RF-4958
Page 2

RESPONSE REQUIRED:

No response to this letter is required. If you have any questions, please contact Vic Terkun at extension 7113.



J. A. Kirkebo
Assistant General Manager
Engineering
EG&G Rocky Flats

VT:sak

Orig. and 1 cc - R. M. Nelson, Jr. w/o Attach.
1 cc - A. Barnard

Attachments:
As Stated

Information requested in the DOE letter of December 3, 1990, has been compiled and is summarized below.

- I. "Findings from the survey and field verification to include the types of modifications or replacements and the reasons the devices do not meet specifications."

A total of 208 existing backflow preventers (BFPs) were inspected by Engineering using an evaluation form specifically developed for this purpose. All of the completed "Backflow Preventers BFPs Evaluation Sheet" forms are enclosed in Attachment B. Each BFP is listed on the form, its compliance or non-compliance with the CDH criteria identified, and any necessary work to bring it in compliance, where needed, is stated. In addition, a summary sheet is included describing the different types of modifications or replacements and any reasons the existing BFPs did not meet the CDH Cross Connection Control Manual (CCCM) requirements.

Over half of the 208 BFPs inspected required modifications and/or replacements. The majority of the modifications were due to improper air gaps, some were obsolete models with slight leaks or missing valves, and others were replacement of functioning BFPs but not on the CDH approved list. There were also 17 new BFPs that Engineering decided should be installed. Most of these to be used for segregating buildings from the site water supply loop. The new installations did not represent direct or even an indirect cross connections. The CCCM, in Section 4.10, requires a BFP to be installed at the service entrance to a building where chemicals or radioactive materials are processed. A CDH representative has acknowledged verbally that this requirement does not apply at Rocky Flats Plant, but Engineering has received nothing in writing to relieve Rocky Flats Plant of this requirement.

Engineering completed designs for 60 BFPs and Maintenance installed approximately 20, with the majority in Building 559. In addition, all deficiencies previously identified by Preventive Maintenance Operations (PMO) were checked first to insure none of them represented an immediate safety hazard as outlined in Phase II. Also, the development of line diagrams for the overall domestic water (DW) systems is nearing completion for Pu facilities, with most of the field work being completed. CADD drawings are now being prepared for these buildings and an evaluation of the DW system by buildings has been started. A summary of the current status of BFPs located inside and outside the PSZ is presented in Attachment C. For each building, the tables show how many BFPs were surveyed, the number of Maintenance Work Orders (MWO) requiring designs, the status of design packages, and line diagram drawings produced. Specific MWO generated for various buildings are listed in Attachment D. For each MWO, a brief description is given summarizing what needs to be done to the BFP.

2. "Funding requirements to make these modifications or replacements".

Engineering estimates that \$500,000 is required for FY91 to perform the

BFP study. This study consists of three phases. Phase I includes the survey of all existing BFPs and designs for modifications/replacements. Phase II of the study covers review and field verification of BFPs which PMO identified as having possible deficiencies. Phase III consists of evaluation of the overall domestic water (DW) systems in each of the buildings on plantsite. This phase includes 1) field surveys to develop line-diagrams of the DW system and all of its branches, 2) generating CADD drawings for each building, 3) performing an engineering evaluation of the DW system to insure proper installation of BFPs and 4) issuing designs for additional BFPs that are needed.

To date, Engineering identified 125 existing BFPs requiring modifications/replacements. An additional 17 new units will need to be installed. Also, after overall DW system evaluation, there may be additional BFPs required. It is estimated the cost to install and modify existing units will be between \$1.5 and \$2.0 million for material and labor.

The current project total cost for Engineering and installations is estimated at \$2.0 to \$2.5 million out of the Expense Budget.

The above estimate does not include the cost for the design and installation of the BFPs on the fire water systems. Presently, the fire water lines entering various buildings are equipped with a single check valve. This does not meet the CDH criteria and double check valves are required. Since the fire water system does not represent the same level of health hazard as the DW system (per CDH CCCM section 4.2.2), it has been given a lower priority. Therefore, the BFPs for the fire water are scheduled to be worked on after completing the DW BFP installation. It is expected to start in FY92 and is estimated to cost between \$3.5 to \$4.5 million. A scope and estimate will be done first to get a better idea on the cost and schedule for the project.

3. "A summary of concerns and reasons for not meeting the previously agreed upon schedule".

Although much has been accomplished, the overall effort has fallen behind the original schedule due to a greater number of BFPs requiring design packages, and the level of effort needed to produce these designs, than originally assumed. The initial schedule was based on finding 30 to 40 BFPs requiring modifications/replacements instead of the 125 existing and 17 new ones. There have also been safety, security, and building operational changes which had a significant impact on the original schedule. Most of the initial schedule slip occurred in designs, installations, and line diagrams (Phase III) for Pu facilities. Additional slippage is due to manpower shortage and training of new AE personnel since they have to go through a learning period.

4. "A revised schedule for obtaining compliance".

The revised schedule (Attachment E) reflects the time necessary to

design and install the greatly increased number of replacements or modifications to existing BFPs. Furthermore, with the field work experience gained in performing overall domestic water system evaluations (Phase III), the updated schedule reflects a more realistic effort required to perform those tasks.

5. "An organizational chart with identification of assignments and responsibilities by individuals for meeting the revised schedule".

See Attachment F for a list of individuals and organizations responsible for meeting the revised schedule.

6. "A summary of the November 21, 1990, conference call to CDH".

See Attachment G which summarized the conference call to CDH.

7. "In addition, EG&G safety and engineering units need to review available data to determine the risk to workers' safety and to identify needed mitigation".

Based on the evaluation of just the existing individual BFPs, Engineering is able to make the following conclusions/observations;

A. The existing BFPs seem to be performing their intended function and no evidence of immediate health hazard to workers from non-operating BFP was found.

B. Most units being replaced are for the purpose of meeting CDH requirements and not because the BFPs do not function. Safety Analysis and Risk Assessment qualitatively judged that considering the probability of failure of BFPs, and the resulting consequence to the workers, the risk would be much less than presented in the Final Safety Analysis Reports.

C. Engineering was aware of several fire protection systems containing glycol, which the Fire Department has been replacing with dry pipe systems. However, there may be 10 buildings that have a propylene glycol/water mixture in extensions of the sprinkler supply piping outside each building. According to the Fire Department, propylene glycol is not toxic (as opposed to ethylene glycol which is toxic).

Looking at just the existing BFP gives an incomplete picture. To assess the risk to workers, an evaluation of the overall DW system is required. Safety Analysis and Risk Assessment and Engineering will assess the adequacy of DW protection after the line diagrams are completed. Each building will have CADD drawings showing the DW routing and branches off the DW lines, as well as all existing BFPs. Once these drawings are available, an evaluation of the DW system and the decision to add or remove any BFPs can then be made.

BFP MAINTENANCE WORK ORDER SUMMARY

<u>TYPE OF CORRECTION REQUIRED</u>	<u>REASON FOR MAKING CORRECTION</u>	<u>NUMBER OF BFPs</u>
A. Replace	1. Improper configuration	10
	2. Wrong Application	16
	3. Leaking/obsolete	9
	4. Failed CDH test	18
	5. Not CDH approved	12
B. Repair	1. Improper air gap	42
	2. Improper configuration	8
	3. Leaking	3
C. Remove	1. BFP not needed	6
	2. Redundant	2
D. New installation	1. Service entrance	11
	2. Additional safety	5
	TOTAL	142

**BACKFLOW PREVENTER (BFP) EVALUATION SHEET
FOR COMPLIANCE WITH CDH CROSS CONNECTION CONTROL**

Building No.: 371 Room No.: 4202 3/4 Column No.: M5/M6
 Manufacturer: Eubeco Model No.: 835-B 1/4
 Serial No.: 10520 Equipment No.: 325-084

Flow Media Temp: Hot Cold
 Upstream (Inlet) Downstream (Outlet)
 (a) potable (a) potable
 (b) other (explain) (b) other (explain)
INDUSTRIAL cold water Process cold water

State justification for the Backflow Preventer at this location

- REDUCED PRESSURE TYPE:
- a) Inches above finished floor 4-8" Must be at least 12 inches
 - b) Diameter of the supply line 3/4"
 - c) Air gap No drainage Must be 2X supply dia. but not less than 1 inch.
 - d) Installation Horiz. Vert. Must be horiz. installation
 - e) Are there isolation valves Yes No Must have two.
 - f) Are the isolation valves CDH approved Yes No If "No," must be replaced after failing the next PMO test.
 - g) Proper testcocks Yes No Must have testcocks before each shut-off valve, check valves and the diff. relief valve. (If "No," must be replaced after failing the next PMO test.)
 - h) Water Teaks Yes No If "Yes," must be repaired or replaced.
 - i) Proper freeze protection N/A Yes No If "Yes," must provide proper protection.

- DOUBLE CHECK VALVE
- a) Inches above finished floor 12 inches
 - b) Type of valve DOE in appli-
 - c) If it is a standard g water
 - d) Are the valves

(Given to DOE were copies of all evaluation sheets like this)

- e) Are the isolation valves CDH approved? Yes No.....If "No," must be replaced after failing the next PMO test.
- f) Proper testcocks Yes No.....Must have approved testcock before each shut-off valve and each check valve. (If "No," must be replaced after failing the next PMO test.)
- g) Water Leaks Yes No.....If "Yes," repair or replace
- h) Proper freeze protection N/A Yes No.....If "No," provide proper protection

PRESSURE TYPE VACUUM BREAKER:

- a) Inches above highest point of use _____".....Must be at least 12 inches
- b) Are there isolation valves Yes No.....Must have two
- c) Are the isolation valves CDH approved? Yes No.....If "No," must be replaced after failing the next PMO test.
- d) Proper testcocks Yes No.....Must have approved testcock before the check valve. (If "No," provide proper protection.)
- e) Water Leaks Yes No.....If "Yes," repair or replace
- f) Proper freeze protection N/A Yes No.....If "No," provide proper protection
- g) Exposed to toxic or poisonous fumes or air borne dust Yes No.....If "Yes," it must be replaced with non-vacuum type BFP.

ATMOSPHERIC VACUUM BREAKER:

- a) Inches above highest point of use _____".....Must be at least 12 inches
- b) Shut-off valves
 - i) Upstream Yes No.....Must have a shut-off valve
 - ii) Downstream Yes No.....No valves shall be installed
- c) Water leaks Yes No.....If "Yes," repair or replace.
- d) Proper freeze protection N/A Yes No.....If "No," provide proper protection
- e) Exposed to toxic fumes or air borne dust Yes No.....If "Yes," it must be replaced with non-vacuum type BFP.

Comments: 2ND Isolation valve is leaking & NOT CDH approved type - Not resilient seated gate.

Inspected by: Chan Organization: FE Date: 6/26/90

Meets Requirements. Yes No FE Engineer: R Chan

Comments: _____

Replace

BACKFLOW PREVENTER(BFP) REPLACEMENT STUDY
 (HEADING DESCRIPTIONS)

FACILITIES ENGINEERING										DEFICIENT	LINE
										BFP'S	DIAGRAMS
BLDG (#BFP)	EXISTING SURVEYED	ADD'L REQ'D	W/O'S GEN.	DESIGN (E)	REVIEW (F)	FINAL (G)	MAINTENANCE			DEFIC/ SURVEYED	FIELD/ DRAWG
							REC'D (H)	IN PROG (I)	COMP (J)		
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)

- A---BUILDING NUMBER(NUMBER OF BFP'S IN THE BUILDING).
- B---NUMBER OF THE EXISTING BFP'S SURVEYED IN THE BLDG.
- C---ADDITIONAL BFP'S REQUIRED AS A RESULT OF THE QUICK SURVEY OF THE AREA.
- D---NUMBER OF BFP'S REQUIRING MODIFICATIONS/REPLACEMENTS UTILIZING W/O'S.
- E---NUMBER OF THE DESIGN PACKAGES STARTED.
- F---NUMBER OF THE DESIGN PACKAGES SUBMITTED FOR REVIEW.
- G---NUMBER OF DESIGN PACKAGES COMPLETED.
- H---NUMBER OF DESIGN PACKAGES RECEIVED BY MAINTENANCE.
- I---IN MAINTENANCE PLANNING OR INSTALLATION.
- J---NUMBER OF INSTALLATIONS COMPLETED.
- K---NUMBER OF BFP'S IDENTIFIED BY PMO IN PHASE II WITH DEFICIENCIES/SURVEYED.
- L---FIELD WALK DOWN OF DOMESTIC WATER SYSTEM/NUMBER OF CADD DRAWINGS COMPLETED.

PSZ

BACKFLOW PREVENTER(BFP) REPLACEMENT STUDY

FACILITIES ENGINEERING

DEFICIENT BFP'S LINE DIAGRAM

BLDG (#BFP)	EXISTING SURVEYED	ADD'L REQ'D	MWO'S GEN.	DESIGN	REVIEW	FINAL	MAINTENANCE			DEFIC/ SURVEYED	FIELD/ DRAWG
							REC'D	IN PROG.	COMP.		
371(4)	4	2	6	5	5	2	2	0	0	1/1	X/0
373(2)	2	0	2	2	2	2	2	0	0	1/1	X/0
374(2)	2	0	1	1	1	1	1	0	0	1/1	X/0
559(18)	18	1	17	17	17	17	17	0	17	1/1	X/2
560(1)	1	0	1	1	1	0	0	0	0	0/0	
561(2)	3	1	4	3	3	2	2	0	0	1/1	0/0
701(1)	1	0	0	0	0	0	0	0	0	0/0	0/0
702(1)	1	0	0	0	0	0	0	0	0	0/0	
703(1)	1	0	1	0	0	0	0	0	0	1/1	
705(1)	1	0	1	1	1	1	1	0	0	1/1	0/0
706(1)	1	0	1	1	1	0	0	0	0	1/1	
707(4)	4	0	4	4	4	4	4	2	2	3/3	X/3
708(1)	1	0	1	1	1	1	1	0	0	1/1	0/0
709(1)	1	0	1	1	1	1	1	0	0	0/0	
718(1)	1	0	0	0	0	0	0	0	0	0/0	
731(1)	1	0	1	0	0	0	0	0	0	0/0	
750(1)	1	0	1	0	0	0	0	0	0	0/0	0/0
762(1)	1	0	0	0	0	0	0	0	0	0/0	
771(8)	8	4	12	12	11	10	10	0	0	6/6	X/12
774(1)	1	1	2	2	2	1	1	0	1	1/1	X/3
776(9)	11	1	8	4	4	3	3	0	0	8/8	X/0
777(8)	8	1	7	2	2	1	1	0	0	8/8	X/0
778(2)	2	1	2	2	2	1	1	0	0	1/1	X/0
779(4)	4	0	3	2	2	0	0	0	0	4/4	X/7
782(1)	1	0	0	0	0	0	0	0	0	0/0	0/0
783(1)	1	0	0	0	0	0	0	0	0	0/0	
788(1)	1	0	0	0	0	0	0	0	0		
910(6)	6	0	4	0	0	0	0	0	0	2/2	
928(2)	2	0	0	0	0	0	0	0	0	1/1	
968(1)	1	0	1	0	0	0	0	0	0	0/0	
990(1)	1	0	1	0	0	0	0	0	0	1/1	
991(6)	6	1	5	0	0	0	0	0	0	6/6	
TOTALS	31(95)	98	13	87	61	60	47	47	2	20	50/50

LEGEND
 X--COMPLETED
 0--NOT COMPLETED

UPDATED
 12/05/90

NON-PSZ

BACKFLOW PREVENTER(BFP) REPLACEMENT STUDY

FACILITIES ENGINEERING

DEFICIENT LINE
BFP'S DIAGRAMS

MAINTENANCE

BLDG (#BFP)	EXISTING SURVEYED	ADD'L REQ'D	MWO'S GEN.	DESIGN	REVIEW	FINAL	MAINTENANCE			DEFIC/ SURVEYED	FIELD/ DRAWG
							REC'D	IN PROG	COMP.		
111(4)	4	0	2	0	0	0	0			0/0	
112(2)	2	0	2	1	1	1	1			0/0	
115(1)	1	0	0	0	0	0	0			0/0	
119(1)	1	1	1	1	1	1	1			1/1	
120(1)	1	0	0	0	0	0	0			0/0	
122(2)	2	1	2	2	2	2	2	2		2/2	
123(8)	8	0	3	3	3	3	3			2/2	
124(3)	3	0	1	1	1	1	1			1/1	
125(2)	2	0	0	0	0	0	0			1/1	
130(3)	3	1	2	1	1	1	1			2/2	
131(3)	3	0	1	1	1	1	1			0/0	
218(1)	1	0	0	0	0	0	0			1/1	
250(1)	1	0	0	0	0	0	0			1/1	
331(3)	3	0	4	4	4	4	4			1/1	
334(3)	3	1	1	1	1	1	1			3/3	
439(1)	1	0	1	0	0	0	0			0/0	
440(1)	1	0	0	0	0	0	0			0/0	
441(1)	1	0	0	0	0	0	0			1/1	
442(1)	1	0	0	0	0	0	0			0/0	
443(2)	2	0	2	0	0	0	0			1/1	
444(24)	24	0	9	0	0	0	0			5/5	
460(10)	10	0	4	0	0	0	0			3/3	
447(7)	7	0	4	0	0	0	0			5/5	
850(6)	6	0	2	0	0	0	0			0/0	
865(4)	4	0	2	0	0	0	0			0/0	
881(4)	4	0	4	0	0	0	0			3/3	
883(6)	6	0	4	0	0	0	0			5/5	
886(3)	3	0	2	0	0	0	0			2/2	
889(1)	1	0	0	0	0	0	0			2/2	
920(1)	1	0	0	0	0	0	0			0/0	
995(2)	2	0	0	0	0	0	0			0/0	
TOTALS	31(112)	110	4	55	13	13	13	3		42/42	

LEGEND
X--COMPLETED
O--NOT COMPLETED

UPDATED
12/05/90

12/05/90

PSZ BUILDINGS
 BACKFLOW PREVENTER (BFP) SURVEY/REPLACEMENT PHASE

EQ#	BLD#	MUC#	DESCRIPTION	SURVEY COMPL	MHO WRITTEN	DESIGN REVIEW	DESIGN FINAL	DESIGN TO MTCE
NEW	371	657137	INSTALL BFP	6/26/90	2/12/90	8/14/90	10/18/90	10/23/90
NEW	371	666371	ADD BFP	6/26/90	6/26/90	8/14/90		
084	371	666370	REPLACE BFP	6/26/90	6/26/90	8/14/90	11/14/90	11/16/90
136	371	666372	REPLACE BFP	6/26/90	6/26/90	10/11/90		
170	371	666369	REPLACE BFP	6/26/90	6/26/90	8/14/90		
234	371	666377	PROVIDE AIR GAP	6/25/90	6/25/90			
134	373	664785	REPLACE ISOLATION VALVE	6/05/90	6/05/90	6/18/90	8/14/90	8/16/90
135	373	664786	REPLACE ISOLATION VALVE	6/05/90	6/05/90	6/18/90	8/14/90	8/16/90
137	374	664784	REPAIR ISOLATION VALVE	6/05/90	6/05/90	6/18/90	8/14/90	8/16/90
138	374	000000	NO WORK NEEDED	6/05/90				
NEW	559	655284	ADD BFP FOR WATER	4/23/90	4/23/90	4/26/90	4/26/90	4/26/90
189	559		CANNOT LOCATE					
005	559	000000	NO WORK NEEDED	4/28/90				
086	559	662297	PROVIDE AIR GAP	4/28/90	4/28/90	5/05/90	5/09/90	5/11/90
087	559	662299	PROVIDE AIR GAP	4/28/90	4/28/90	5/05/90	5/09/90	5/11/90
088	559	662300	REMOVE BFP	4/28/90	4/28/90	5/04/90	5/09/90	5/11/90
089	559	662614	REPLACE BFP	4/28/90	5/02/90	5/05/90	5/09/90	5/11/90
090	559	662616	REPLACE BFP	5/02/90	5/02/90	5/05/90	5/09/90	5/11/90
091	559	662613	REPLACE BFP	5/02/90	5/02/90	5/05/90	5/09/90	5/11/90
092	559	662302	REMOVE BFP	4/28/90	4/28/90	5/04/90	5/09/90	5/11/90
093	559	662301	REMOVE BFP	4/28/90	4/28/90	5/04/90	5/09/90	5/11/90
095	559	662306	REMOVE BFP	4/28/90	4/28/90	5/04/90	5/09/90	5/11/90
096	559	662308	REMOVE HOSEBIB AND BFP	4/28/90	4/28/90	5/05/90	5/09/90	5/11/90
097	559	662307	REMOVE HOSEBIB AND BFP	4/28/90	4/28/90	5/05/90	5/09/90	5/11/90
098	559	662304	REMOVE BFP	4/28/90	4/28/90	5/04/90	5/09/90	5/11/90
099	559	662615	REPLACE BFP	5/02/90	5/02/90	5/05/90	5/09/90	5/11/90
100	559	662305	REMOVE BFP	4/28/90	4/28/90	5/04/90	5/09/90	5/11/90
216	559	662296	PROVIDE AIR GAP	4/28/90	4/28/90	5/05/90	5/09/90	5/11/90
226	559	662295	REPLACE BFP	4/28/90	4/28/90	5/05/90	5/09/90	5/11/90
227	560	664781	REPLACE ISOLATION VALVE	6/01/90	6/01/90	6/18/90		
NEW	561	663757	REPLACE CHECK VALVE	5/18/90	5/18/90			
083	561	664044	REPLACE W/COH APPVD	5/18/90	5/18/90	5/31/90	6/18/90	6/19/90
084	561	663758	REPLACE W/COH APPVD	5/18/90	5/18/90	5/31/90	6/18/90	6/19/90
162	561	663759	PROVIDE AIR GAP	5/18/90	5/18/90	10/11/90		
123	701	000000	NO WORK NEEDED	8/03/90				
117	702	000000	NO WORK NEEDED	8/02/90				
118	703	665492	PROVIDE AIR GAP	8/02/90	5/27/90			
101	705	663241	PROVIDE AIR GAP	5/08/90	5/08/90	5/17/90	5/21/90	5/22/90
102	706	665499	REPLACE BFP	6/25/90	6/27/90	8/14/90		
077	707	663197	PROVIDE AIR GAP	5/08/90	5/10/90	5/12/90	5/16/90	5/18/90
078	707	663242	PROVIDE AIR GAP	5/08/90	5/10/90	5/12/90	5/16/90	5/18/90
079	707	663244	PROVIDE AIR GAP	5/08/90	5/10/90	5/12/90	5/16/90	5/18/90
194	707	663196	REPLACE BFP	5/08/90	5/10/90	5/12/90	5/16/90	5/18/90
081	708	663251	PROVIDE AIR GAP	5/08/90	5/08/90	5/17/90	5/21/90	5/22/90

12/05/90

PSZ BUILDINGS
 BACKFLOW PREVENTER (BFP) SURVEY/REPLACEMENT PHASE

ED#	BLD#	HWO#	DESCRIPTION	SURVEY COMPL	HWO WRITTEN	DESIGN REVIEW	DESIGN FINAL	DESIGN TO MTCE
082	709	663508	REPIPE BFP	5/08/90	5/15/90	6/29/90	8/14/90	8/16/90
066	718	000000	NO WORK NEEDED	8/08/90				
080	731		REPLACE BFP	8/06/90	8/06/90			
076	750		PROVIDE AIR GAP	8/02/90	8/02/90			
111	762	000000	NO WORK NEEDED	7/15/90				
NEW	771	664138	INSTALL BFP	5/24/90	5/24/90	6/18/90	8/15/90	8/21/90
NEW	771	664783	INSTALL BFP	6/04/90	6/04/90	6/29/90		
NEW	771	666373	INSTALL BFP	6/25/90	6/27/90			
NEW	771	666375	INSTALL BFP	6/26/90	6/27/90	8/14/90	11/26/90	11/28/90
127	771	663507	PROVIDE AIR GAP	5/14/90	5/14/90	5/31/90	6/07/90	6/11/90
128	771	663504	REPLACE BFP	5/14/90	5/14/90	5/30/90	6/18/90	6/19/90
129	771	663505	REPLACE BFP	5/14/90	5/14/90	5/24/90	6/07/90	6/11/90
130	771	663502	REPLACE BFP	5/14/90	5/14/90	5/24/90	6/07/90	6/11/90
131	771	663503	REPLACE BFP	5/14/90	5/14/90	5/24/90	6/07/90	6/15/90
132	771	663506	PROVIDE AIR GAP	5/14/90	5/14/90	5/31/90	6/07/90	6/11/90
147	771	663501	REPLACE BFP	5/14/90	5/14/90	5/24/90	6/07/90	6/11/90
218	771	663500	REPLACE BFP	5/14/90	5/14/90	5/24/90	6/18/90	6/19/90
NEW	776	666374	ADD BFP	6/25/90	6/25/90	8/14/90		
133	776	661843	BFP REPLACEMENT	4/23/90	4/23/90	4/30/90	4/30/90	5/20/90
NEW	776	667153	INSTALL BFP	7/06/90	7/06/90			
107	776	663672	REPLACE FOR HOT WATER	5/06/90	5/16/90			
113	776	000000	NO WORK NEEDED	6/28/90				
114	776	000000	NO WORK NEEDED	6/28/90				
119	776	000000	NO WORK NEEDED	6/28/90				
120	776	000000	NO WORK NEEDED	6/28/90				
121	776	667152	REMOVE BFP	7/06/90	7/06/90			
122	776	667150	REMOVE BFP	7/06/90	7/06/90			
211	776	667154	REPLACE BFP	7/06/90	7/06/90			
213	776	663673	PROVIDE AIR GAP	5/16/90	5/16/90	5/31/90	6/07/90	6/15/90
###	776	665773	REMOVE VAC. BREAKER	5/21/90	5/21/90	8/14/90	11/09/90	11/12/90
###	776	665774	REMOVE VAC. BREAKER	5/21/90	5/21/90	8/14/90	11/20/90	11/22/90
NEW	777	664780	INST BFP SERV ENTRANCE	6/01/90	6/01/90	10/11/90		
103	777	000000	NO WORK NEEDED	7/09/90				
104	777	667019	PROVIDE AIR GAP	7/09/90	7/09/90			
105	777	666316	PROVIDE AIR GAP	7/09/90	7/09/90			
106	777	667017	REPLACE WITH BFP	7/09/90	7/09/90			
109	777	667011	PROVIDE AIR GAP	7/09/90	7/09/90			
210	777	000000	NO WORK NEEDED	6/01/90				
214	777	664610	REPLACE BFP	5/30/90	5/30/90	6/18/90	10/18/90	10/22/90
215	777	664611	REPLACE BFP	5/30/90	5/30/90	cancel		

12/05/90

PSZ BUILDINGS
 BACKFLOW PREVENTER (BFP) SURVEY/REPLACEMENT PHASE

EQ#	BLD#	MWO#	DESCRIPTION	SURVEY COMPL	MWO WRITTEN	DESIGN REVIEW	DESIGN FINAL	DESIGN TO MTCE
NEW	778	664139	INSTALL NEW BFP	5/25/90	5/25/90	10/12/90		
108	778	663677	REPAIR PER FE DRAWINGS	5/16/90	5/16/90	6/20/90	10/19/90	10/31/90
112	778	000000	NO WORK NEEDED	5/25/90				
124	779	665503	PROVIDE AIR GAP	7/16/90	4/20/90			
125	779	000000	NO WORK NEEDED	7/16/90				
126	779	665500	PROVIDE AIR GAP	7/16/90	4/20/90	10/11/90		
238	779	665501	PROVIDE AIR GAP	7/02/90	4/20/90	11/9/90		
144	782	000000	NO WORK NEEDED	8/02/90				
230	783	000000	NO WORK NEEDED	8/03/90				
###	788	000000	NO WORK NEEDED	8/6/90				
181	910		REPLACE BFP	8/03/90	8/03/90			
182	910	000000	NO WORK NEEDED	8/06/90				
183	910		REPLACE BFP	8/06/90	8/06/90			
184	910		REPLACE BFP	8/03/90	8/03/90			
185	910		REPLACE BFP	8/03/90	8/03/90			
187	910	000000	NO WORK NEEDED	8/07/90				
222	923	000000	NO WORK NEEDED	8/06/90				
225	925	000000	NO WORK NEEDED	8/07/90				
085	968		REPLACE BFP	8/06/90	8/06/90			
069	990		REPLACE BFP	8/06/90	8/06/90			
NEW	991		INSTALL BFP	7/30/90	7/30/90			
070	991	666252	REPLACE AIR GAP	7/30/90	4/19/90			
071	991	000000	NO WORK NEEDED	7/30/90				
072	991		PROVIDE AIR GAP	7/30/90	7/30/90			
186	991	000000	NO WORK NEEDED	7/30/90				
257	991	666276	REPLACE BFP	7/30/90	4/19/90			
258	991	666233	REPLACE BFP	7/30/90	4/19/90			

12/05/90

NON PSZ BUILDING
 BACKFLOW PREVENTER (BFP) SURVEY/REPLACEMENT PHASE

EQ#	BLD#	MJC#	DESCRIPTION	SURVEY COMPL	MJO WRITTEN	DESIGN REVIEW	DESIGN FINAL	DESIGN TO NTCE
001	111	777777	77777777	8/27/90				
002	111	000000	NO WORK NEEDED	8/27/90				
003	111	777777	77777777	8/27/90				
250	111	000000	NO WORK NEEDED	8/27/90				
246	112	672571	RELOCATE HOSE 3188	8/29/90	8/29/90	10/3/90	10/19/90	10/25/90
247	112	777777	77777777	8/29/90				
251	115	000000	NO WORK NEEDED	8/27/90				
NEW	119	667504	REPLACE VACUUM BREAKER	7/10/90	7/10/90	10/2/90	10/17/90	10/19/90
139	119	000000	NO WORK NEEDED	7/10/90				
245	120	000000	NO WORK NEEDED	8/29/90				
006	122	000000	NO WORK NEEDED	6/19/90				
007	122	666518	SUPPLY WATER	6/26/90	6/28/90	7/12/90	8/20/90	8/20/90
NEW	122	663881	SCRUB TABLE BFP	6/1/90	5/25/90	6/19/90	7/02/90	7/04/90
004	123	658387	REPLACE BFP	6/12/90	3/05/90	9/21/90	10/10/90	10/12/90
009	123	000000	NO WORK NEEDED	8/14/90				
010	123	000000	NO WORK NEEDED	8/14/90				
011	123	000000	NO WORK NEEDED	8/14/90				
012	123	000000	NO WORK NEEDED	8/14/90				
148	123	668587	REPLACE BFP	8/14/90	7/26/90	8/22/90	9/14/90	9/17/90
249	123	669996	RELOCATE HOSE 3188	8/14/90	8/14/90	9/26/90	10/10/90	10/12/90
255	123	000000	NO WORK NEEDED	6/12/90				
151	124							
152	124	665776	REPLACE BFP W/APPRVD	6/15/90	6/15/90	6/22/90	8/15/90	8/24/90
153	124							
013	125	000000	NO WORK NEEDED	7/10/90				
014	125	000000	NO WORK NEEDED	8/27/90				
NEW	130	664037	INSTALL BFP	6/20/90	6/15/90	6/30/90	8/06/90	8/06/90
053	130	670436	REPLACE BFP	8/16/90	8/16/90			
235	130	000000	NO WORK NEEDED	6/26/90				
240	130	000000	NO WORK NEEDED	6/26/90				
241	131	000000	NO WORK NEEDED	8/16/90				
242	131	000000	NO WORK NEEDED	8/16/90				
244	131	670429	REPLACE BFP	8/16/90	8/16/90			
015	218	000000	NO WORK NEEDED	6/26/90				
219	250	000000	NO WORK NEEDED	6/26/90				
016	331	667674	REPLACE BFP	7/13/90	6/12/90	8/20/90	9/14/90	9/17/90
017	331	664087	ISOLATE CAR WASH	6/01/90	4/11/90	6/18/90	7/05/90	7/06/90
018	331	667688	R/R BFP	8/09/90	7/14/90	9/11/90	9/27/90	10/1/90
020	334	669621	REPLACE BFP	8/09/90	8/09/90			
156	334	669622	REPLACE FUNNEL	6/05/90	8/09/90			
252	334	669620	REPLACE HOSE 3188	8/09/90	8/09/90			
NEW	334	665778	INSTALL PRESSURE BFP	6/14/90	6/15/90	7/02/90	8/22/90	8/24/90

12/05/90

NON PSZ BUILDING
 BACKFLOW PREVENTER (BFP) SURVEY/REPLACEMENT PHASE

EQ#	BLD#	MWO#	DESCRIPTION	SURVEY COMPL	MWO WRITTEN	DESIGN REVIEW	DESIGN FINAL	DESIGN TO NTCE
027	439	672065	PROVIDE AIR GAP	11/8/90	9/12/90			
028	440	000000	NO WORK NEEDED	11/1/90				
023	441	000000	NO WORK NEEDED	6/28/90				
024	442	000000	NO WORK NEEDED	9/28/90				
025	443	777777	77777777	6/27/90	8/16/90			
024	443	668582	R/R BFP	6/27/90	7/26/90			
268	444	000000	NO WORK NEEDED	11/6/90				
029	444	000000	NO WORK NEEDED	11/6/90				
030	444	000000	NO WORK NEEDED	11/6/90				
031	444	000000	NO WORK NEEDED	11/6/90				
032	444	777777	REMOVE BFP	11/7/90				
033	444	000000	NO WORK NEEDED	11/6/90				
035	444	668893	REPLACE BFP	11/5/90	6/6/90			
036	444	667870	REPLACE BFP	11/6/90	7/11/90			
037	444	000000	NO WORK NEEDED	11/6/90				
038	444	000000	NO WORK NEEDED	11/12/90				
039	444	668894	REPLACE BFP	11/12/90	6/6/90			
040	444	000000	NO WORK NEEDED	11/12/90				
041	444	000000	NO WORK NEEDED	11/12/90				
042	444	665154	PROVIDE AIR GAP	11/6/90	6/11/90			
043	444	000000	NO WORK NEEDED	11/6/90				
044	444	664683	PROVIDE AIR GAP	11/5/90	5/8/90			
045	444		CAM NOT LOCATE	11/6/90				
046	444	000000	NO WORK NEEDED	11/6/90				
047	444	675620	REPLACE BFP	11/5/90	11/9/90			
048	444	650351	REPAIR/REPLACE BFP	11/6/90	6/11/90			
050	444	000000	NO WORK NEEDED	11/6/90				
197	444	000000	NO WORK NEEDED	11/6/90				
220	444	000000	NO WORK NEEDED	11/5/90				
236	444	675615	REPLACE BFP	11/5/90	11/12/90			
269	444	000000	NO WORK NEEDED	11/6/90				
###	444	667870	REMOVE BFP	11/6/90				
051	447	667431	PROVIDE AIR GAP	11/10/90	7/9/90			
052	447	675614	PROVIDE AIR GAP	11/10/90	11/12/90			
054	447	000000	NO WORK NEEDED	11/9/90				
055	447	000000	NO WORK NEEDED	11/9/90				
145	447	668806	REPAIR BFP	11/10/90	7/20/90			
225	447	000000	NO WORK NEEDED	11/9/90				
231	447	675618	PROVIDE AIR GAP	11/10/90	11/12/90			
034	460	000000	NO WORK NEEDED	11/7/90				
163	460	000000	NO WORK NEEDED	11/7/90				

12/05/90

NON PSZ BUILDING
BACKFLOW PREVENTER (BFP) SURVEY/REPLACEMENT PHASE

EQ#	BLD#	MWO#	DESCRIPTION	SURVEY COMPL	MWO WRITTEN	DESIGN REVIEW	DESIGN FINAL	DESIGN TO MTCE
164	460	666834	REPLACE BFP	11/7/90	7/6/90			
165	460	000000	NO WORK NEEDED	11/7/90				
166	460	000000	NO WORK NEEDED	11/7/90				
167	460	000000	NO WORK NEEDED	11/7/90				
168	460	000000	NO WORK NEEDED	11/7/90				
169	460	667089	INSTALL PROPER BFP	11/7/90	6/17/90			
171	460	666862	REPLACE BFP	11/6/90	6/28/90			
179	460	675585	PROVIDE AIR GAP	11/6/90	11/12/90			
022	850	669764	REPAIR/REPLACE BFP	11/13/90	7/30/90			
094	850		CAM NOT LOCATE	11/13/90				
232	850	000000	NO WORK NEEDED	11/13/90				
239	850	675704	PROVIDE AIR GAP	11/13/90	11/13/90			
253	850		CAM NOT LOCATE	11/13/90				
256	850	000000	NO WORK NEEDED	11/13/90				
062	865	000000	NO WORK NEEDED	11/14/90				
063	865	000000	NO WORK NEEDED	11/14/90				
064	865	675700	PROVIDE AIR GAP	11/14/90	11/14/90			
065	865	654966	REPAIR/REPLACE BFP	11/14/90	1/17/90			
019	881		CAM NOT LOCATE	11/13/90				
021	881	000000	NO WORK NEEDED	11/13/90				
056	881	659830	REPAIR/REPLACE BEP	11/13/90	3/5/90			
057	881	659829	REPAIR/REPLACE BEP	11/13/90	3/5/90			
###	881	675694	PROVIDE AIR GAP	11/14/90	11/14/90			
###	881	675695	PROVIDE AIR GAP	11/14/90	11/14/90			
058	883	652698	BACKFLOW PREVENTER	11/14/90	11/30/90			
059	883	654967	REPAIR/REPLACE BFP	11/14/90	1/17/90			
060	883	675703	PROVIDE AIR GAP	11/14/90	11/14/90			
259	883	000000	NO WORK NEEDED	11/14/90				
260	883	675822	PROVIDE AIR GAP	11/13/90	11/15/90			
261	883	000000	NO WORK NEEDED	11/14/90				
067	886	665148	PROVIDE AIR GAP	11/14/90	4/16/90			
068	886	665149	PROVIDE AIR GAP	11/14/90	4/16/90			
180	886	000000	NO WORK NEEDED	11/14/90				
061	889	000000	NO WORK NEEDED	11/14/90				
248	920	000000	NO WORK NEEDED	9/28/90				
036	995	000000	NO WORK NEEDED	9/28/90				
073	995	000000	NO WORK NEEDED	9/28/90				

BACKFLOW PREVENTER STUDY SCHEDULE
 (Revision)

MILESTONE	<u>START</u>	<u>END</u>	<u>STATUS</u>	<u>RESP. ORG.</u>
<u>PHASE I</u>				
1. Develop CDH Cross Connection Compliance Form	4/23/90	5/2/90	Complete	FE
2. Survey Existing BFP (Bldg. 559 & 707)	4/25/90	5/7/90	Complete	FE
3. Survey Existing BFP (Bldg. 771, 776/777, & 779)	5/8/90	5/23/90	Complete	FE
4. Survey Existing BFP (Bldg. 371, 374 & 774)	5/24/90	6/8/90	Complete	FE
5. Survey Existing BFP (Other Hazardous Facilities)	6/11/90	12/01/90	Complete	FE
6. Survey Existing BFP (All Other Buildings)	7/17/90	12/01/90	Complete	FE
7. Replacement of BFP	5/7/90	10/01/91	Rev. Date	Mtce.
<u>PHASE II:</u>				
8. Field Verify Deficient BFP	5/8/90	5/23/90	Complete	FE
9. Replace Deficient BFP	5/15/90	10/01/91	Rev. Date	Mtce.
<u>PHASE III:</u>				
10. Evaluate Overall DW System (Pu Buildings)	5/21/90	6/01/91	Rev. Date	FE/SA & RA
11. Evaluate Overall DW System (400, 800 & 900 Complexes)	8/21/90	6/01/91	Rev. Date	FE/SA & RA
12. Evaluate Overall DW System (100, 300, 500 & 600 Complexes)	11/21/90	6/01/91	Rev. Date	FE/SA & RA
13. Install BFP	6/15/90	10/01/91	Rev. Date	Mtce.
14. Create CADD Drawings of Overall DW System	8/1/90	10/01/91	Rev. Date	FE

CROSS CONNECTION CONTROL PROGRAM VERIFICATION/INSTALLATION RESPONSIBILITIES

ORGANIZATION

1. Facilities Engineering

RESPONSIBILITIES

- o Survey Existing BFPs
- o Evaluate Deficiencies
- o Field Verify DW Systems
- o Develop Line Diagrams
- o Evaluate Overall DW Systems
- o Generate Designs

INDIVIDUAL

V. Terkun

2. Safety Analysis and Risk Assessment

- o Evaluate Overall DW Systems

T. L. Foppe

3. Operations Managers

- o Maintenance
- o Install BFPs in Buildings under their responsibilities

(See list of Operations Managers)

OPERATIONS MANAGERS

Liquid Waste Treatment
F. P. McMorris
 x7729, B/374, Fax 4579

226 231A 774
 227 231B 910
 228A 374 964
 228B 428
 231 732

Solid Waste Treatment
J. M. Bower
 x6679, B/776, Fax 5718

776
 889
 899A

Regulated & Sanitary Waste
J. A. Cluccl
 x5841, B/750, Fax 4388

219 882 910 952
 301 884 930 988
 308 885 931 990
 750A 887 932 994
 775 904A 933 985
 881 905B 934

Waste Assay & Shipping
C. E. Trump
 x7945, B/664, Fax 5668

569 668
 570 668
 664 668B
 775
 788

Waste Repackaging & Solidification
J. D. Roberts
 x8129, 788/Ponds/Pads/Tennis, Fax 4048

207 Ponds 803A
 750 Tennis 903 PAD
 775 904B
 788

Analytical Operations
J. A. Gels
 x7088, B/779, Fax 2982

528 780
 559 780A
 705 780B
 779 865
 779A

Material Processing
J. L. Hubert
 x5001, B/771, Fax 4942

218 771A 771E 771J
 714 771B 771F 771K
 728 771C 771G 771L
 770 771D 771H 772
 771

Material Processing Support
D. R. Jackson
 x4749, B/371, Fax 7432

371
 376
 381

Pu Fabrication Pyrochemical Ops.
P. S. Yela
 x7371, B/707, Fax 7311

707 777 898
 730 778 897
 731 991 898
 732 984 899

Non-Plutonium Operations
R. G. Johnson
 x7418, B/444, Fax 5513

444 828 883A
 445 868 883B
 447 860 883D
 448 883 888

Non-Plutonium Operations
K. G. Tallman
 x4350, B/460, Fax 4845

439 439D
 439A 440
 439B 460

Utilities Systems
T. J. Smith
 x2537, B/124, Fax 5662

124 443 558 711 827
 215A-D 450 560 712 863
 216 451 581 713 867
 221 453 582 715 868
 223 454 563 718 869
 224 455 670 727 875
 240 457 575 729 879
 253 462 661 782 881F-G
 254 515 662 783 890
 262 516 675 784 928
 377 517 708 785 985
 427 518 709 788 989
 442 555 710 787

Support Services Area I
J. R. Marschall
 x2715, B/331, Fax 5278

020 130 334B 558
 060 131 335 557
 081 180 441 883
 100 T230 441A 690A-M
 112 250 442A 707S
 112A-B 251 448 760A
 113 252 452 762
 114 302 452A-G 630
 115A 303 481 884
 120 307 651 920
 122 331 551A 965
 123 331A 552 987
 123B 333 653 992
 129 334 554 893

Support Services Area II
J. R. Cable
 x7498, B/750, Fax 7540

111 387 568 773
 116 371H-J 708 782
 119 372 708A 782A
 121 372A 707B 850
 T121 375 750 881A-B
 122S 378 750B-E 898
 125 428B 781 900
 128 444A 762A 901
 127 549 763 988
 128 549A 764A 967
 260 550 765 968

INTEROFFICE CORRESPONDENCE

DATE: December 4, 1990 1-021
FROM: R. G. Chain
TO: Backflow Preventer Study File
SUBJECT: CROSS CONNECTION REPORTING REQUIREMENTS
REFERENCE: November 21, 1990 Telcom with Colorado Department of Health
(CDH) Representative

PURPOSE:

The purpose of the letter is to document the telephone conference conversation on Wednesday November 21, 1990 between Glenn Bodnar of the CDH, Ms. Annette Barnard of the U.S. Department of Energy (DOE), Mr. Vic Terkun of EG&G Rocky Flats, and myself. The purpose of the conversation was to get clarification on CDH reporting requirements and apparent conflicts between regulatory documents published by the State of Colorado.

DISCUSSIONS:

It is our understanding that the following paraphrased questions and answers accurately summarized Mr. Bodnar's replies to our (DOE and EG&G) questions.

1. Q: How do we resolve conflicts between the definition of a cross connection in the Colorado "Primary Drinking Water Regulations" (PDWR) and the Colorado "Cross Connection Control Manual" (CCCM).
A: The PDWR takes precedence, legally.
2. Q: Should EG&G Rocky Flats report each discovered cross connection within ten days of discovery as required by the PDWR, section 11.1.2, paragraph 5?
A: No. Where an organization has a documented program for identification and remediation of cross connections, CDH prefers to get a periodic status report.
3. Q: EG&G Rocky Flats is installing Reduced-Pressure-Principle (RPP) backflow preventers at the domestic water service entrance to all buildings in order to meet requirements of section 4.10 of the Colorado CCCM, and because it seems to be good engineering practice. Does the Colorado PDWR or CCCM identify this as correction of an existing cross connection?
A: No. That requirement was written to protect the drinking water supply system when the water purveyor and operator of a premise (building) are two separate entities. Where the purveyor and user are on entity (as Rocky Flats), backflow preventers at building service entrances are not required.

4. Q: Where the CCCM requires a double-check valve to isolate a fire protection sprinkler piping system not containing chemicals, does a cross connection exist if only a single check valve is in place?

A: Yes.

5. Q: The Colorado PDWR & CCCM divide cross connections into two categories, health hazard and non-health hazard. Since fire protection sprinkler systems not containing toxic chemicals are defined as non-health hazard in the CCCM, are we justified in making those a lower priority and dealing with them after we complete repair/replacement/installation of RPP backflow preventers in potential health hazard situations?

A: Yes.

CONCLUSION:

In summary, EG&G Rocky Flats is under the impression that CDH is satisfied with the cross connection remediation program at Rocky flats. Regular reports will be made of our progress.

RESPONSE REQUIREMENTS:

No response is required.

RGC:sak

cc:

V. Issaian

V. Terkun



JOINT COMPANY - UNION SAFETY COMMITTEE

Date: August 23, 1990
To: [REDACTED]
From: E. I. Tietenberg^{es} / S. Cordova^{SC}, J.C.U.S.C., T-690-G, Ext. 7620/5800
Subject: INTERIM LETTER FOR SAFETY CONCERN NUMBER 90-012 / POSSIBLE WATER
CROSS CONTAMINATION

After several meetings, Facilities Engineering (FE) has proposed a study to address the issue what are the governing codes, how do they impact on the plant and whether a code violation exists.

Please review the study and let us know if it satisfies your concern. If there are any issues not addressed or any questions that have not been answered, the J.C.U.S.C. will be happy to convene a meeting where the questions can be answered.

cmp

Attachments:

- A. E. I. Tietenberg/S. Cordova ltr to M. G. Borge, Backflow Preventers, August 14, 1990
- B. Facilities Engineering Evaluation Of Code Requirements Pertaining To Backflow Preventers On Emergency Safety Showers
- C. R. C. Lerche ltr to P. J. Suniewick, Backflow Preventers, March 23, 1990
- D. Radiological Engineering Evaluation of Employee Suggestion 90-012

cc:

G. W. Coles
S. Cordova
R. C. Cordova
J. P. Jens
T. F. Lewis
J. R. Majestic
R. B. Wilkinson

updat012.et

JCUSC/PERFORMANCE ASSURANCE VERIFICATION FORM

CONCERN NO 90-012 BUILDING NO 334 INITIATOR [REDACTED]

STATEMENT OF CONCERN: POSS. CONTAMINATION (WATER)

VERIFICATION DETAIL - Describe the actions taken to reach a conclusion on this concern.

ALL ACTIONS ARE COMPLETED.

Check One

- Completed - Proposed actions are completed.
- Not Completed - Proposed actions are not completed, due dates for actions have passed.
- Pending - Proposed actions are not completed, but due dates for actions have not passed.
- Insufficient Data - Insufficient data in file to verify.

VERIFICATION BY C. D. Buckley
JCUSC APPROVAL BY _____

DATE 4/17/91
DATE _____

Distribution:

JCUSC

INTEROFFICE CORRESPONDENCE

February 3, 1990

DKP-04-90.9

DATE K. Freiberg, 8334
TO
FROM D. K. Pegram *DKP*
SUBJECT CROSS CONNECTION - BACK FLOW PREVENTER FAILURES DOMESTIC WATER SUPPLY SYSTEM - POTENTIAL FOR BACK SIPHONAGE OF CONTAMINATION INTO PLANT DRINKING WATER SYSTEM

Recently Industrial Hygiene identified a number of concerns regarding the back flow preventer inspection and maintenance on the plant site. These deficiencies need to be corrected in order to protect the health of plant employees and conform with Colorado Drinking Water Regulations.

Finding #1:

Preventative Maintenance employees conducting back flow preventer inspections are untrained and not certified.

Solution #1:

Preventative Maintenance employees that are inspecting back flow preventers must attend an approved training program and become certified. maintenance supervision is planning to send it's inspectors to a training class in March.

Finding #2:

There is no plant standard for a procedure in conformance with Colorado Department of Health Standards for inspection of back flow preventers, delineation of responsibility for maintaining the program, worker training requirements, inspection frequency, repair or replacement, and engineering design.

Solution #2:

A standard needs to be prepared by Plant Maintenance Engineering with concurrence by Facilities Engineering.

3. Freiberg
DKP-01-90.10
February 8, 1990
Page 2

Finding #3:

the repair of failed back flow preventers is not receiving maintenance priority at the appropriate level. Failed back flow preventers are not being repaired or replaced within Colorado Department of Health restrictions of two weeks. Currently there are 70 failed back flow preventers with work orders dating back to November, 1989.

Solution #3:

All work orders that are generated as a result of a failed back flow preventer inspection report must be stamped as a priority 1 safety item by the area safety engineer. An auditable tracking system indicating the status of each back flow preventer must be developed. No back flow preventer shall be allowed to continue to be operated in an unsafe condition.

Non-compliance will result in the suspension of use of domestic water in the affected area by Industrial Hygiene. If you have any further questions, please do not hesitate to contact me at X7098.

Authority: DOE Order 6430.1 and 5480.4
40 CFR 141-143

1910.141-143
Colo. Part I Title 25 CRS 1973

APPROVED:



T. F. Lewis

February 8, 1990

ksh

CC: B. Chapman
K. [unclear]
J. [unclear]
J. Weayer



JOINT COMPANY - UNION
SAFETY COMMITTEE

December 19, 1990

recogniz.012

To: J. P. Jens
Assistant General Manager
Health and Safety
T-130-G
Ext. 3080

From: E. I. Tietenberg / S. Cordova
Co-Chairmen
JCUSC
T-452-B / T-690-G
Ext. 7620 / Ext. 5800

RE: SPECIAL RECOGNITION FROM GENERAL MANAGER OR ASSISTANT GENERAL MANAGER,
HEALTH AND SAFETY

In January 1990, Mr. [REDACTED] filed an Employee Suggestion pertaining to possible cross-contamination of potable water. Subsequently, they brought the issue to the attention of the Joint Company/Union Safety Committee (JCUSC) where a Safety Concern 90-012 was filed. Investigation by E. I. Tietenberg and S. Cordova revealed that the issue was broader than originally identified. The major concern was the possibility of the plants not complying with the requirements of the Colorado Department of Health (CDH) Cross-Connection Control Manual.

The JCUSC requested Facilities Engineering to evaluate the requirements and to verify compliance. This effort began in June of 1990 and was completed on August 14, 1990. The evaluation revealed no direct violations, but numerous deficiencies. Corrective actions were identified in a letter from J. A. Kirkebo, EG&G, to R. M. Nelson, Jr., DOE, subject: Colorado Health Department Request For Cross-Connection Control Survey, December 6, 1990.

The initiative and concern of by Mr. [REDACTED] figured directly in the evaluation of the potable/drinking water system at the Rocky Flats Plant, and will result in numerous repairs and replacements of backflow preventers, thus enhancing the health of all employees at the plant. Total estimated cost for the project is anticipated to be between 2.0 and 2.5 million dollars.

Please advise on the appropriate recognition for the efforts of Mr. [REDACTED] Mr. [REDACTED], whose persistence resulted in a successful resolution of the safety concern.

Attached please find copies of all documentation we have in the files on this concern.

cmp

Attachments:
As Stated

cc:

G. G. Balint
J. R. Majestic

A. H. Burlingame
J. R. Marschall

B. M. Clausen
P. North

R. C. Cordova
J. M. Wilson

SEE REVERSE SIDE BEFORE COMPLETING OR MAILING THIS FORM.

EMPLOYEE SUGGESTION PROGRAM

DO NOT WRITE IN THIS BLOCK	DATE RECEIVED	SUGGESTION NO.
----------------------------	---------------	----------------

HOURLY SALARIED

SUGGESTER	(LAST NAME) (FIRST NAME) (INITIAL)	BLDG. 334	DEPT. NAME PMO.	EMPLOYEE NUMBER	SHIFT /
	JOB TITLE PIPEFITTER	TELE. EXT. 2720 7839	SUPERVISOR'S NAME BUD CHAPMAN	TELE. EXT.	
CO-SUGGESTER	(LAST NAME) (FIRST NAME) (INITIAL)	BLDG. 334	DEPT. NAME PMO	EMPLOYEE NUMBER	SHIFT /
	JOB TITLE PIPEFITTER	TELE. EXT. 2720 7839	SUPERVISOR'S NAME BUD CHAPMAN	TELE. EXT.	

THE TITLE OR SUBJECT OF MY SUGGESTION IS:
AIR BORN RADIO ACTIVE CONTAMINATION INTO DOMESTIC WATER SYSTEM.

PRESENT METHOD OR PROBLEM: POSSIBLE CROSS CONNECTIONS BETWEEN AIR BORN RADIO ACTIVE CONTAMINATION AND DOMESTIC WATER SYSTEM THROUGH UNPROTECTED EMERGENCY SHOWER AND EYE BATH FIXTURE IN RADIO ACTIVE CONTROLLED AREA.

SEE DETAILS AND EXAMPLES ON ATTACHED SHEETS.

PROPOSED METHOD OR SOLUTION: INSTALL REDUCED PRESSURE PRINCIPLE TYPE BACK FLOW PREVENTOR ON EACH EMERGENCY SHOWER AND EYE BATH UNITS IN RADIO ACTIVE CONTROLLED AREA.

SEE ATTACHED DRAWING.

IN WHAT WAY WILL THE COMPANY BENEFIT FROM YOUR IDEA (S)?
PROTECT COMPANY, EMPLOYEES AND PUBLIC FROM DRINKING AND USING RADIO ACTIVE CONTAMINATED WATER.

I have read the Policy and Rules on the reverse side of this form and my foregoing suggestion is submitted for consideration under the stated terms of the Company and Employee Suggestion Program. I understand and agree that if my suggestion is adopted, Rockwell International Corporation and its subsidiaries and their successors and assignees thereof, shall have the right to make full use of same.

DATE 1-10-90

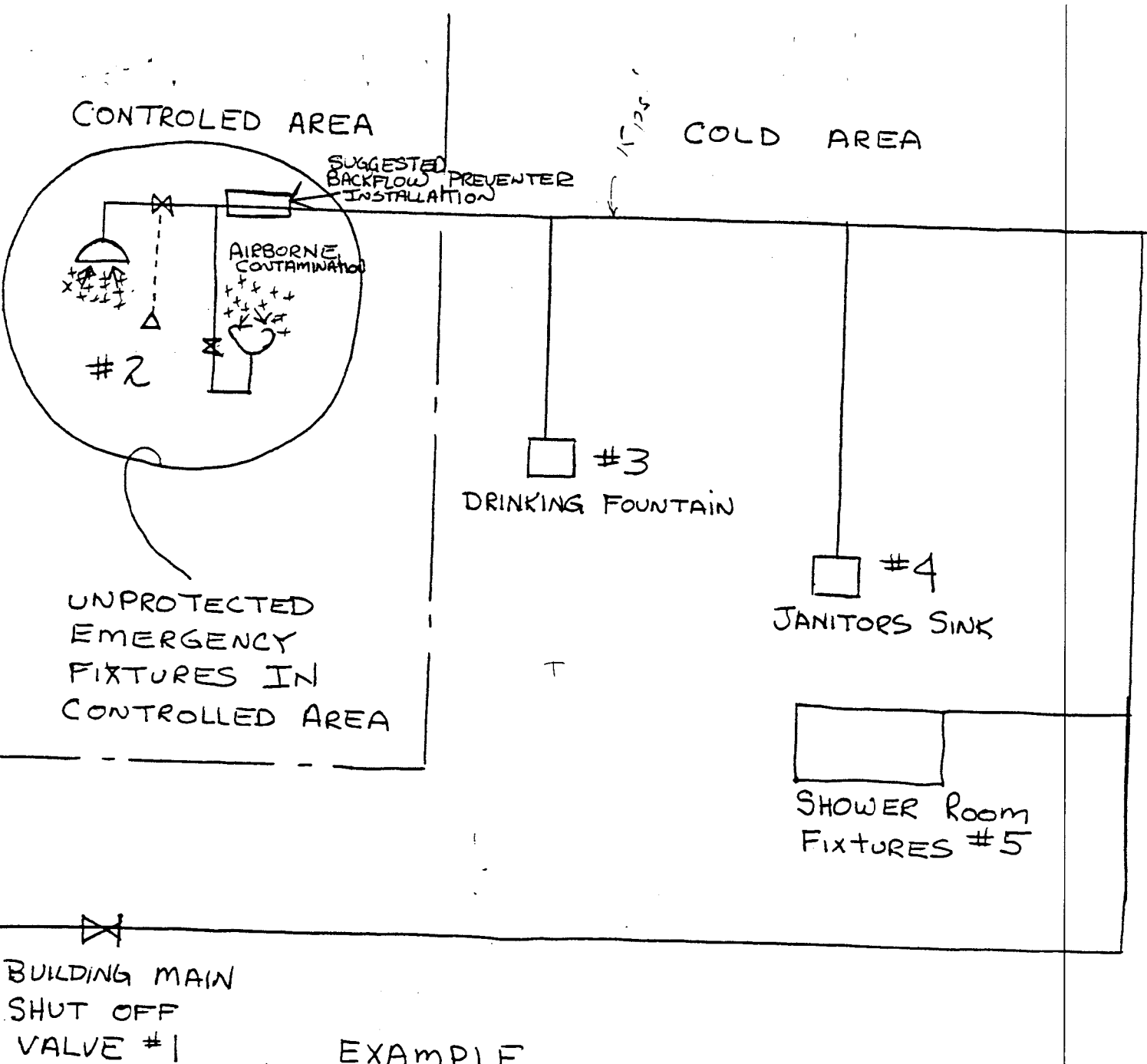
DATE 1-10-90

REVIEWED FOR CLASSIFICATION:

AUTHORIZED CLASSIFIER DATE

ADDITIONAL CO-SUGGESTERS (PLEASE ATTACH SIGNATURES)

FOLD HERE



EXAMPLE

- ① WHEN MAIN BUILDING SHUT OFF VALVE (#1) IS OFF FOR BUILDING REPAIR OR REMODEL AND SYSTEM BEING DRAINED, SOMEONE USES EMERGENCY SHOWER OR EYEBATH (#2). AS WATER DRAINS TO LOW LOCATIONS (#3, 4, 5) AIRBORNE ^{RADIOACTIVE} CONTAMINATION WILL BE SUCKED THROUGH THE UNPROTECTED EMERGENCY FIXTURES (#2) IN CONTROLLED AREA INTO DOMESTIC WATER SYSTEM UNDER VACUUM.
- ② THE AIRBORNE CONTAMINATION AND DOMESTIC WATER WILL BE IN THE SAME DOMESTIC WATER SYSTEM

- ③ ANY LOWER FIXTURE (#3,4,5,) DRINKING FOUNTAIN, LAVATORY'S ETC, COULD DISCHARGE THE CONTAMINATED WATER WHILE DRAINING
- ④ WHEN WATER PRESSURE IS TURNED BACK ON (#1) TO THE SYSTEM THE CONTAMINATED WATER WILL DISCHARGE THROUGH DOMESTIC FIXTURES (#3,4,5) UNDER PRESSURE
- ⑤ CONSIDERING BUILDING WATER SYSTEMS ARE SHUT DOWN FOR ANY PURPOSES (REPAIRS, REMODELS, ETC) THIS TYPE OF CROSS-CONNECTION COULD OCCURE AT ANY TIME
- ⑥ LOCATION OF THESE EMERGENCY FIXTURES IN CONTROLLED AREAS ARE PLANTWIDE KNOWN EXAMPLES ARE:

BLDG 559 BY ROOM 103 A

BLDG 559 BY ROOM 101 B

BLDG 776 BY ROOM 161-A

BLDG 776 BY ROOM 154 BETWEEN COL. G-2W AND F2W NEAR F-3W

BLDG 776 BY ROOM 154-A

BLDG 776 BY ROOM 134 COL D-8

HOSE IS CONNECTED WITH NO BACKFLOW PREVENTER

BLDG 776 BY ROOM 156

- ⑦ AN APPROVED BACKFLOW DEVISE SHOULD BE INSTALLED PER INDIVIDUAL FIXTURE
- ⑧ IF YOU HAVE ANY QUESTIONS ON THIS SUGGESTION PLEASE CONTACT BUCK CHOI OR TED KOCOL AT 2720 OR 7839

SEE REVERSE SIDE BEFORE COMPLETING OR MAILING THIS FORM.

DO NOT WRITE IN THIS BLOCK	DATE RECEIVED	SUGGESTION NO.
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SUGGESTER	NAME (Last, First, Middle Initial)	BLDG.	DEPARTMENT NAME	EMPLOYEE NUMBER	SHIFT
	[REDACTED]	334	P.M.O	[REDACTED]	1
CO-SUGGESTER	NAME (Last, First, Middle Initial)	BLDG.	DEPARTMENT NAME	EMPLOYEE NUMBER	SHIFT
	[REDACTED]	334	P.M.O	514535	1
JOB TITLE <input checked="" type="checkbox"/> Hourly <input type="checkbox"/> Salaried		TELE. EXT.	SUPERVISOR'S NAME (Last, First, Middle Initial)	TELE. EXT.	
PIPEFITTER		7839	CHAPMAN BUD	[REDACTED]	

THE TITLE OR SUBJECT OF MY SUGGESTION IS: ILLEGAL INSTALLATION OF BACKFLOW PREVENTER

PRESENT METHOD OR PROBLEM: LOCATION: EAST OF BLDG 708, SOUTH OF COOLING TOWER THERE IS A REDUCED PRESSURE BACKFLOW PREVENTER INSTALLED IN A PIT. THIS INSTALLATION DOES NOT COMPLY WITH COLORADO DEPT OF HEALTH CROSS CONNECTION CONTROL CODE.

PROPOSED METHOD OR SOLUTION: MODIFY INSTALLATION OF BACKFLOW PREVENTER TO MEET COLORADO DEPT OF HEALTH SPECS. (SEE ATTACHED DRAWINGS FOR PROPER INSTALLATION)

IN WHAT WAY WILL THE COMPANY BENEFIT FROM YOUR IDEA (S)? PROTECT EMPLOYEES HEALTH AND COMPLY WITH COLORADO DEPT OF HEALTH REQUIREMENTS.

I have read the Policy and Rules on the reverse side of this form and my foregoing suggestion is submitted for consideration under the stated terms of the Company and Employee Suggestion Program. I understand and agree that if my suggestion is adopted, EG&G Rocky Flats, Inc., and its subsidiaries and the successors and assignees thereof, shall have the right to make full use of same.

SUGGESTER: Walden Reed DATE: 2-11-90 CO-SUGGESTER: Puberty Chen DATE: 2-11-90

REVIEWED FOR CLASSIFICATION: _____

AUTHORIZED CLASSIFIER: _____ DATE: _____

ADDITIONAL CO-SUGGESTERS (PLEASE ATTACH SIGNATURES)

EMPLOYEE SUGGESTION PROGRAM

FOLD HERE

- 5.2 Backflow prevention devices installations shall be inspected and approved for use by the AUTHORITY HAVING JURISDICTION. Inspections can be scheduled by calling () at least 24 hours in advance of the desired inspection time. See Section 3.8.
- 5.3 All backflow devices shall be installed in the horizontal position. Variance by review only on retrofit fire systems.
- 5.4 A pressure vacuum breaker shall be used where the device is never subjected to backpressure and installed a minimum of twelve (12) inches above the highest piping or outlet downstream of the device in a manner to preclude backpressure.
- 5.5 An atmospheric vacuum breaker shall be used only where the device is:
- 5.5.1 Never subjected to continuous pressure (more than 12 hours continuous).
- 5.5.2 Installed with the air inlet in a level position and a minimum of six (6) inches above the highest piping or outlet it is protecting.
- 5.5.3 No valves shall be permitted downstream of the device.
- 5.6 The single check valve is not considered to be a backflow prevention device.
- 5.7 Double check valve assemblies may be installed in below grade vaults when these vaults are properly constructed in accordance with Drawings 1 through 9.
- 5.8 Reduced pressure backflow preventers will be installed above ground. The unit should be placed at least twelve inches (12) above the finish grade to allow clearance for the repair work. A concrete slab at finish grade is recommended. Proper drainage should be provided for the relief valve and may be piped away from the location, provided it is readily visible from above grade and the relief valve is separated from the drainline by a minimum of double the diameter of the supply line. A modified vault installation may be used if constructed with ample side clearances. Freezing is a major problem in this area. Precautions should be taken to protect above ground installations.

Health.

- 2.3 Cross Connection Control Committee, Pacific Northwest Section AWWA Manual of Accepted Procedures and Practices.
- 2.4 Recommended Practice for Backflow Prevention and Cross Connection Control AWWA Manual M11.
- 2.5 Definitions of terms used in this regulation are those contained in "Colorado Department of Health Cross Connection Manual". Available for review at (ADDRESS OF LOCAL AUTHORITY)

3.0 GENERAL REQUIREMENTS:

3.1 Building plans submitted to the (LOCAL BUILDING DEPARTMENT) will be reviewed by the Cross Connection Control Section, and approved prior to the issuance of a building permit.

BUILDING PLANS MUST SHOW:

- 3.1.1 Water service size and location
- 3.1.2 Meter size and location
- 3.1.3 Backflow prevention device size, type and location.
- 3.1.4 Fire sprinkling system(s) service line, size and type of backflow prevention device.
- 3.2 Backflow prevention devices are to be installed in an accessible locations to facilitate maintenance, testing and repair. Drawings 1 through 10 show various installations.
- 3.3 All backflow prevention devices shall be installed immediately downstream of the water meter.
- 3.4 Before installing a backflow prevention device, pipelines should be thoroughly flushed to remove foreign material.
- 3.5 In no case will it be permissible to have connections or tees between the meter and service line backflow prevention device.
- 3.6 In no case is it permissible to connect the relief valve discharge on the reduced pressure device into a sump, drainage ditch, etc.
- 3.7 Backflow prevention valves are not to be used as the inlet or outlet valve of the water meter. Test cocks are not to be used as supply connections.
- 3.8 In order to insure that backflow prevention

COLORADO DEPARTMENT OF HEALTH

INSTALLATION OF REDUCED PRESSURE BACKFLOW PREVENTERS

Reduced pressure backflow preventers will be installed above ground. (Fig. A) The unit should be placed at least twelve inches (12") above the finish grade to allow clearance for repair work. A concrete slab at finish grade is recommended. Proper drainage should be provided for the relief valve and may be piped away from the location, provided it is readily visible from above grade and the relief valve is separated from the drain line by a minimum of double the diameter of the supply line. A modified vault installation may be used if constructed with ample side clearances. (Fig. B)

ABOVE GROUND INSTALLATION

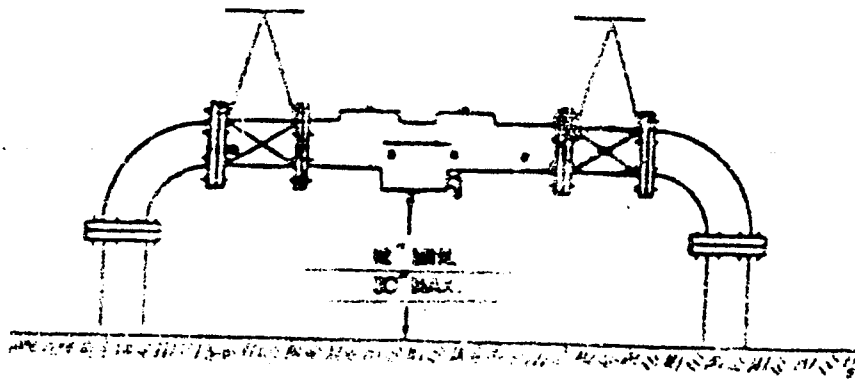


FIG. A

MODIFIED VAULT INSTALLATION

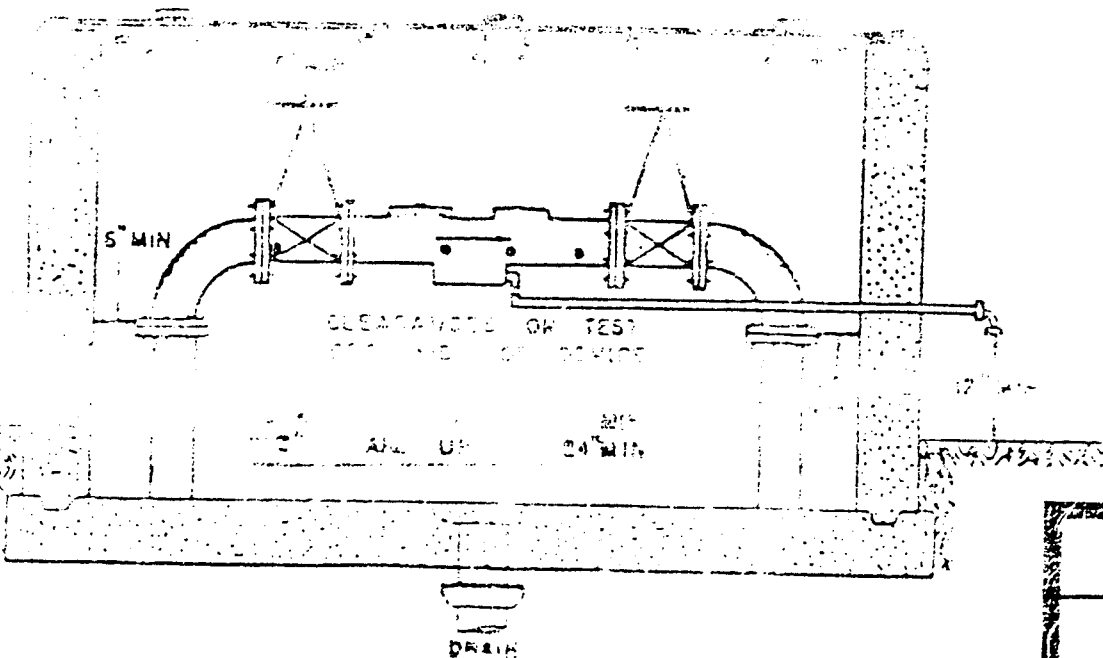


FIG. B

COLORADO DEPT. OF HEALTH DRINKING WATER SECTION CROSS CONNECTION CONTROL
INSTALLATION OF REDUCED PRESSURE BACKFLOW PREVENTERS
D & G NO. _____

SEE REVERSE SIDE BEFORE COMPLETING OR MAILING THIS FORM.

DO NOT WRITE IN THIS BLOCK	DATE RECEIVED	SUGGESTION NO.
----------------------------	---------------	----------------

SUBMITTER	BLDG. DEPARTMENT NAME	SHIFT
	334 P.M.O	1
CO-SUBMITTER	BLDG. DEPARTMENT NAME	EMPLOYEE NUMBER SHIFT
	334 P.M.O	1
JOB TITLE <input checked="" type="checkbox"/> Hourly <input type="checkbox"/> Salaried	SUPERVISOR'S NAME (Last, First, Middle Initial)	TELE. EXT.
PIPEFITTER	CHAPMAN BUD	
JOB TITLE <input checked="" type="checkbox"/> Hourly <input type="checkbox"/> Salaried	SUPERVISOR'S NAME (Last, First, Middle Initial)	TELE. EXT.
PIPE FITTER	CHAPMAN BUD	

THE TITLE OR SUBJECT OF MY SUGGESTION IS: Improper BACKFLOW PREVENTER INSTALLATION

PRESENT METHOD OR PROBLEM: IN BLDG 707 THERE IS A BACKFLOW PREVENTER THAT IS NOT PROPERLY ^{INSTALLED} THAT COULD CAUSE A HEALTH HAZARD AND DOES NOT COMPLY WITH COLO. DEPT. OF HEALTH REGULATIONS. ① NO AIR GAP AT BACKFLOW PREVENTER ② DRAIN FROM RELIEF PORT EXTENDED BELOW FLOOD LEVEL RIM OF JANITORS SINK ③ BACKFLOW PREVENTER DRAIN AND PROCESS WATER LINE ARE TIED TOGETHER.

PROPOSED METHOD OR SOLUTION: REPIPE INSTALLATION OF BACKFLOW PREVENTER TO MEET COLO DEPT OF HEALTH REGULATIONS (SEE ATTACHED DRAWING)

FOLD HERE ▼

IN WHAT WAY WILL THE COMPANY BENEFIT FROM YOUR IDEA(S)? PROTECT EMPLOYEES HEALTH AND COMPLY WITH COLO DEPT OF HEALTH REGULATIONS

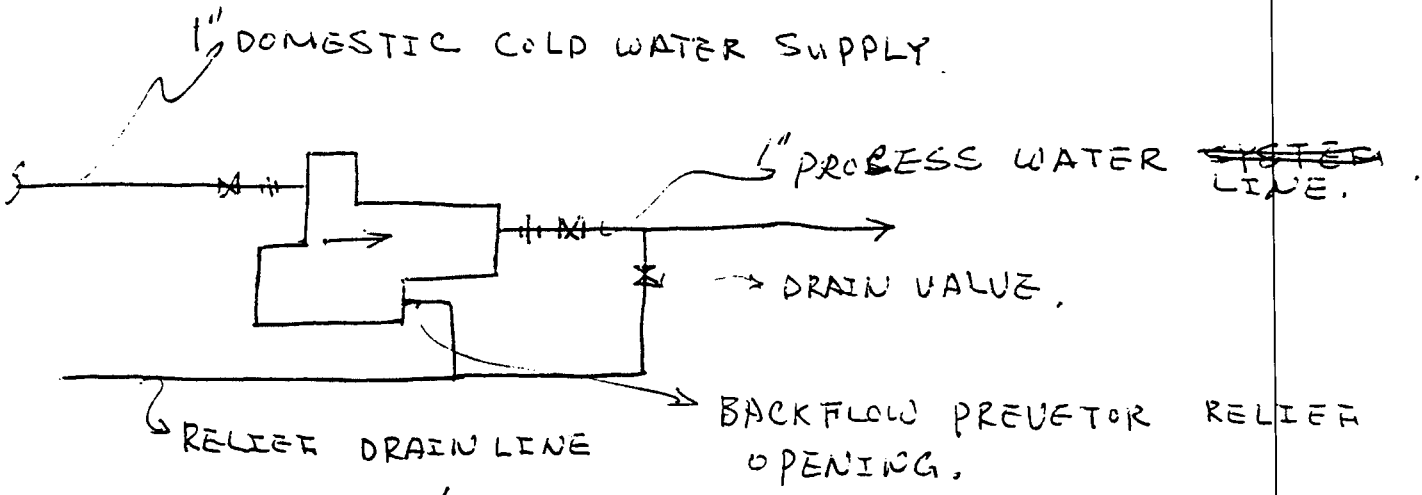
I have read the Policy and Rules on the reverse side of this form and my foregoing suggestion is submitted for consideration under the stated terms of the Company and Employee Suggestion Program. I understand and agree that if my suggestion is accepted, EG&G Rocky Flats, Inc., and its subsidiaries and the right to make full use of same.

2-11-91 DATE
 2-11-90 DATE

REVIEWED FOR CLASSIFICATION _____ DATE _____

NOT RECLASSIFIED _____ DATE _____

EMPLOYEE SUGGESTION PROGRAM



RELIEF DRAIN LINE
TO JANITOR'S SLOP
SINK ABOUT 25' AWAY.

BACKFLOW PREVENTOR RELIEF
OPENING.
IT REQUIRES AIR GAP
TO TEST & FUNCTION THE
DEVICE PROPERLY.

SOLUTION: PROVIDE AIR GAP AT THE RELIEVE
DISCHARGE OPENING ~~AND~~ AND DIS CONNENEC
THE DRAIN LINE AT THE PROCESS WATE
LINE DRAIN VALVE.

SAFETY CONCERN WORKSHEET
(Please Print)

GENERAL INFORMATION:

(*2) Date Received: 1 / 11 / 90 (*1) Number: 90-012()
(3) Priority (H,M,L): H
(*4) Title: POSS. Contam. water
(5) Initiated by: [REDACTED] (6) Emp. Number: [REDACTED]
(*7) Initiation/Start Date: 1 / 11 / 90 (8) Emp. Phone No: [REDACTED]

MANAGEMENT INFORMATION:

(9*) Supervisor/Person Resp: B. Chapman (*10) Phone: 2720
(11) Date Supervisor Answered: 2/24
(12) Direct Report Manager: K. Frieberg (13) Phone: 2372
(14) Bldg: 334 (15) Bldg. Manager: S.K. Stovall

SAFETY NOTIFICATIONS:

(17) Date: 1 / 11 / 90
(16) Discipline: J.M. Langsted Bldg: 750
(18) Area Safety Eng: S.M. Nesta Bldg: T690B
(19) Union Steward: S. Cordova Bldg: T690G
(20) Co. Co-Chairman: E. Tietenberg Bldg: T452B
(21) Union Co-Chair: S. Cordova Bldg: T690G
(22) Company Member: E. Tietenberg Bldg: T452B
(23) Union Member: S. Cordova

INVESTIGATION STATUS:

(25) Date Contacted Employee: / /
(*26) Investigation Comments: _____

(*27) Invest. Review/Due Date: / / (28) Status (1-5)
(29) Actions Indent. (Y or N): (30) Interim Letter Date: / /
(*31) Close Date: / / (*32) Closed By: _____

To be filled out when submitting action items

JOINT COMPANY/UNION SAFETY COMMITTEE CONCERN FORM

(Use Black Ink Only & Retain Copy For Your Records)
Mail: JCUSC, T690G

Case No. 90-012

EMPLOYEE NAME [REDACTED] EMPLOYEE NUMBER [REDACTED]
DEPARTMENT PMO BLDG. 334 PHONE [REDACTED] SHIFT 1
SUPERVISOR (Print) BUD CHAPMAN SUPV. EXT. 2720
DIRECT REPORT MANAGER (Print) KEN FRIEBERG MANAGER EXT. 2372

I have previously discussed this Concern with Supervision: Yes No.

Concern (briefly) POSSIBLE CROSS CONNECTIONS BETWEEN AIR BORN RADIO ACTIVE
CONTAMINATION AND DOMESTIC WATER SYSTEM THROUGH UNPROTECTED EMERGENCY
SHOWER AND EYE BATH FIXTURE IN RADIO ACTIVE CONTROLLED AREA.
(THIS SAFETY CONCERN SHOULD HAVE IMMEDIATE ACTION)

[REDACTED]

1-11-90 [Signature] 1-11-90
Date Steward Signature Date

Supervision Response (within 5 working days) _____

Supervision Signature _____ Date _____
Direct Report Manager Signature _____ Date _____

NOTE: TIMELINESS IN COMPLETING THIS FORM IS OF THE UTMOST IMPORTANCE.

_____ I am satisfied with the results. _____ I am not satisfied.

Brief reason if not satisfied: _____

Employee Signature _____ Date _____

JCUSC received Safety Concern on: _____

To be completed by the JCUSC Co-Chairperson(s)

Assigned to: Union: [Signature] Date 1-11-90
Company: [Signature] Date 1-11-90

Distribution: Safety Committee (White)
Union Steward (Green)
Employee (Goldenrod)



INTEROFFICE CORRESPONDENCE

DATE August 14, 1990 6-3
TO E. I. Tietenberg/S. Cordova
FROM M. G. Bogre, Plant Utilities Engineering, x7048
SUBJECT BACKFLOW PREVENTERS ON EMERGENCY EYEWASHES AND SAFETY SHOWERS

Employee Suggestion No. 90-012 contained an expression of concern over the issue of backflow preventers on Emergency Eyewash and Safety Shower units in radioactive controlled areas. Facilities Engineering was requested to examine this issue from a code compliance standpoint. The results of this investigation are presented in the attached document, "Facilities Engineering Evaluation of Code Requirements Pertaining to Backflow Preventers on Emergency Safety Showers". I hope you find this report helpful. If you have any questions regarding this document, please call me at extension 7048.

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FACILITIES ENGINEERING EVALUATION OF CODE REQUIREMENTS
PERTAINING TO BACKFLOW PREVENTERS ON EMERGENCY SAFETY SHOWERS

(REF: EMPLOYEE SUGGESTION 90-012)

BACKGROUND

Employee Suggestion 90-012 contains an expression of concern over the possibility of cross connections existing between airborne radioactive contaminants and the domestic water system. The contention is made that under certain extraordinary conditions backflow could occur and air could be drawn into the piping through the emergency safety shower (and safety eye wash) fixtures in radioactive-controlled areas. This could lead to the possibility of airborne radioactive particulates entering the domestic water lines. The employee suggestion contains the proposal that in order to reduce the potential for this type of cross connection, reduced pressure type backflow prevention devices should be installed at all emergency safety showers in radioactive-controlled areas.

A legal opinion has been expressed [RCL-1(76)-90 memo from R. C. Lerche to P. J. Suniewick, 6-23-90 (attached)] that Rocky Flats is under no statutory obligation to comply with any state or local codes, regulations or other requirements, concerning backflow prevention, because the Rocky Flats Plant does not supply drinking water to the public. However, this opinion suggests that DOE Order 6430.1A requires that Rocky Flats comply with the Safe Drinking Water Act and all other state, regional and local requirements.

INTRODUCTION

Facilities Engineering (FE) has been asked to determine which, if any, codes, regulations or requirements are applicable to the problem of backflow prevention in emergency safety showers (and eyewashes). The primary document chosen for guidance in this task is the Colorado Department of Health Cross Connection Control Manual. This manual contains the laws, codes and regulations pertaining to cross connection control, along with case histories and other relevant information. The Colorado Cross Connection Control Manual borrows heavily from the Uniform Plumbing Code (U.P.C.) which is the model plumbing code for the State of Colorado. Rocky Flats Plant standards (SMU 100,101,102) and ANSI standards (Z358.1-1990) were also studied.

EVALUATION

No codes or regulations have been located which specifically require backflow prevention devices for emergency safety shower (or eyewash) applications. The absence of specific code or regulatory requirements dictates that an evaluation be made of the more general code requirements in order to determine whether or not backflow preventers are required for emergency safety showers.

Examination of the various code requirements indicates that a certain amount of risk-based interpretation is implied in the wording of the codes and that the primary intent of all such codes is to protect health. This approach is supported implicitly by the Safe Drinking Water Act 1986, which states in part:

National interim primary drinking water regulations promulgated

under paragraph (1) shall protect health to the extent feasible, using technology, treatment techniques and other means, which the Administrator determines are generally available (taking costs into consideration) on the date of enactment of this title.

The Safe Drinking Water Act appears to allow for the exercise of a certain amount of reasonable informed judgement on the part of the administrator as to what constitutes a threat to health and what measures are feasible and readily available to safeguard health. The inclusion of the clause "taking costs into consideration" implies that an engineering analysis of cost vs risk is an integral part of the process of formulating regulations under this Act.

DOE Order 6430.1A also contains general policy guidelines which allow for the exercise of professional engineering judgement when making decisions concerning code requirements. (See Appendix V, 7. Policy and Objectives, 0101-1 General, 0101-2 Criteria Deviations.)

The FE position is also reflected in DOE Order 6430.1A, Section 1540-1.5 SAFETY DEVICES which states in part:

"Backflow preventers and air gaps shall be used to prevent cross connection (contamination) of potable water supplies. Vacuum breakers (to prevent back siphonage) shall be used only in conjunction with administrative controls."

This indicates to FE that the main concern of DOE Order 6410.1A is the prevention of contamination of potable water supplies. This is also the main concern of FE. Contamination is, by definition, impairment of the quality of potable water to a degree which creates an actual hazard to the public health (APPENDIX, II, 13). DOE Order 6430.1A specifies that for existing facilities original design criteria apply in general and that this Order (DOE 6430.1A) only applies to new facilities, additions and modifications. (See Appendix V, 0101-1, General.)

The case can also be made for a risk-based evaluation of the codes by examining the definitions used in formulating the codes. For reference, several relevant definitions taken from the Colorado Cross Connection Control Manual and the U.P.C. are presented in the Appendix.

In addition, the Uniform Plumbing Code contains the following rather general definitions and requirements.

(k) Cross Connection - A cross connection is any connection or arrangement, physical or otherwise, between a potable water supply system and any plumbing fixture or any tank, receptacle, equipment or device, through which it may be possible for non-potable, used, unclean, polluted and contaminated water, or other substances, to enter into any part of such potable water system under any condition.

CHAPTER 10 - WATER DISTRIBUTION

SECTION 1002 - UNLAWFUL CONNECTIONS

(a) No installation of potable water supply piping or part

thereof shall be made in such a manner that it will be possible for used, unclean, polluted or contaminated water, mixtures or substances to enter any portion of such piping from any tank, receptacle, equipment or plumbing fixture by reason of backsiphonage, by suction or any other cause, either during normal use and operation thereof or when any such tank, receptacle, equipment or plumbing fixture is flooded or subject to pressure in excess of the operating pressure in the hot or cold water piping.

(b) No plumbing fixture, device or construction shall be installed or maintained or shall be connected to any domestic water supply, when such installation or connection may provide a cross connection between a distributing system of water for drinking and domestic purposes and water which may become contaminated by such plumbing fixture, device or construction unless there is a provided backflow prevention device approved for the potential hazard.

Section 1002(a) of the U.P.C. appears to deal with future installations, whereas 1002(b) also prohibits maintaining systems (apparently existing) which may provide a cross connection. Section 1002(b) leaves it to the user to determine which backflow prevention device has been "approved for the potential hazard."

The broad wording contained in these definitions and codes, if interpreted literally would require backflow preventers for every plumbing fixture in the plant because by these definitions almost any fixture could be considered a cross connection. A hazard to health does not have to exist for an arrangement or fixture to be considered a cross connection.

The requirements contained in the Colorado Cross Connection Control Manual seem to be concerned primarily with the problem of cross connections between the potable water system and impure, contaminated or polluted water (or other objectionable liquids). Little consideration is given to the possibility of backflow of air occurring and the attendant risk of airborne pollutants or contaminants entering the potable water system. This is very apparent when the air gap separation method of backflow prevention is examined.

The air gap separation method is a recommended protection against backflow in many situations. It is widely used and is generally quite effective in preventing the backsiphonage of liquids into the potable water supply. However, it is easy to imagine a scenario in which backflow of air could occur. This brings up the possibility of airborne gases or particulates entering a potable water supply. The introduction of these gases or particulates could cause pollution or contamination of the potable water supply. The fact that an air gap separation is an approved method of backflow prevention while at the same time constituting a cross connection by the literal U.P.C. definition indicates that the U.P.C. allows for a certain amount of risk-based interpretation of the codes and definitions contained therein.

CONCLUSIONS

The conclusion drawn from this analysis is that the U.P.C. and other codes are subject to a certain amount of interpretation and that any evaluation of the

codes must be risk-based.

FE believes that certain ideas are implied in the codes even when not stated explicitly, i.e., by the U.P.C. definition of cross connection the possibility of any substance being introduced into the system constitutes a cross connection. In the view of FE, this implicitly refers to the introduction of substances of such a nature or in such levels as to constitute a hazard to the potability of the water supply, even though this is not so stated in the code.

Certainly, anyone with an active imagination could visualize some highly unlikely scenario in which almost any plumbing fixture anywhere could be considered a cross connection by the U.P.C. definition. It is obvious, however, that in general plumbing practice some judgement is allowed concerning likelihood of risk or degree of hazard when evaluating the plumbing codes. Therefore, in the absence of any specific requirements concerning backflow preventers on emergency safety showers in radioactive-controlled areas, FE feels it is the responsibility of the purveyor (Rocky Flats Plant) to exercise reasonable, informed judgement in assessing the degree of hazard posed by the arrangement in question, and then proceed accordingly. This being the position of FE, refer to the assessment which Radiological Engineering produced concerning the degree of risk that is posed by the present emergency safety shower arrangement. That assessment recommends that no modification to the existing system be made. [See "Radiological Engineering Evaluation of Employee Suggestion 90-012" (attached)]

It is apparent from examination of the various codes that the codes are general enough as to allow for different interpretations. This being the case, FE has attempted to divine the "spirit of the law" and use that basis to evaluate "the letter of the law." FE feels that the spirit of the law is more important than the letter of the law and that the spirit of the law is to protect health. This is also the main concern of FE. In keeping with the EG&G commitment to improving the safety of the workplace wherever feasible, FE will comply with DOE Order 6430.1A, and give careful consideration to potential cross connection-related health hazards in all existing and future installations. FE designs will incorporate backflow preventers wherever it is determined that the risk to health is to the degree that such protection is warranted.

Mike Bogre
Plant Utilities Engineering
27 July 1990

M. G. Bogre

APPENDIX

I. SAFE DRINKING WATER ACT - 1986

TITLE XIV - "SAFETY OF PUBLIC WATER SUPPLIES"
SECTION 1412 - NATIONAL DRINKING WATER REGULATIONS

National interim primary drinking water regulations promulgated under paragraph (1) shall protect health to the extent feasible, using technology, treatment techniques and other means, which the Administrator determines are generally available (taking costs into consideration) on the date of enactment of this title.

II. COLORADO CROSS CONNECTION CONTROL MANUAL

1. "Air Gap." The unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture, other device or vessel and the flood level rim of said vessel.

13. "Contamination" means an impairment of the quality of the potable water by sewage, industrial fluids or waste liquids, compounds or other materials to a degree which creates an actual hazard to the public health through poisoning or through the spread of disease.

15. "Cross Connection" means any physical arrangement whereby a potable water supply is connected, directly or indirectly, with any other water supply system, sewer, drain, conduit, tank, plumbing fixture or other device which contains, or any contain, contaminated water, sewage or other waste, liquid or gas of unknown or unsafe quality which may be capable of imparting contamination or pollution to the potable water supply as a result of backflow. Bypass arrangements, jumper connections, removable spools, swivel or changeover devices, four-way valve connections and other temporary or permanent devices through which, or because of which, backflow could occur are considered to be cross connections.

22. "Hazard-Pollution." An actual or potential threat to the physical properties of the water system or to the potability of the public or the consumer's potable water system but which would constitute a nuisance or be aesthetically objectionable or could cause damage to the system or its appurtenances, but would not be a threat to life or be dangerous to health.

27. "Pollution" means the presence of any foreign substance (organic, inorganic, radiological or biological) in the water that may degrade the water quality so as to constitute a non-health type hazard or impair its usefulness.

28. "Potable Water" means water free from impurities in amounts sufficient to cause disease or harmful physiological effects. The bacteriological, chemical and radiological quality shall conform with State of Colorado Primary Drinking Water Regulations.

III. UNIFORM PLUMBING CODE

SECTION 103

- (a) **Backflow** - Backflow is the flow of water or other liquids, mixture or substances into the distributing pipes of a potable supply of water from any sources other than its intended source. (See **Back-Siphonage**.)
- (b) **Backflow Connection**--Backflow connection or condition is any arrangement whereby backflow can occur.
- (c) **Backflow Preventer** - A backflow preventer is a device or means to prevent backflow into the potable water system.
- (d) **Back-Siphonage** - Back-siphonage is the flowing back of used, contaminated or polluted water from a plumbing fixture or vessel into a water supply pipe due to a negative pressure in such pipe. (See **Backflow**.)
- (k) **Cross Connection** - A cross connection is any connection or arrangement, physical or otherwise, between a potable water supply system and any plumbing fixture or any tank, receptacle, equipment or device, through which it may be possible for non-potable, used, unclean, polluted and contaminated water, or other substances, to enter into any part of such potable water system under any condition.

SECTION 1003 - CROSS CONNECTION CONTROL

APPROVAL OF DEVICES - Before any device is installed for the prevention of backpressure or backsiphonage, it shall have first been approved by the Administration Authority. Devices shall be tested in conformity with recognized standards or other standards acceptable with the intent of this code.

IV. AMERICAN NATIONAL STANDARD Z358.1-1990

4.6.3 (Emergency Showers) The shower shall be assembled in accordance with the manufacturer's instructions.

5.4.2 (Eyewash)...Units shall be installed in accordance with the manufacturer's instructions and acceptable plumbing practices.

7.4.2 (Eye/face wash)...Units shall be installed in accordance with manufacturer's instructions and acceptable plumbing practices.

V. DOE ORDER 6430.1A

7. POLICY AND OBJECTIVES

a. Policy. It is DOE policy that:

- (1) Professional architectural and engineering principles and practices be applied to the planning, design, construction, alterations and/or acquisition of the Department's facilities.
- (3) The planning, design and construction of the Department's

facilities will be performed in a manner that will satisfy all applicable Executive Orders, Federal laws and regulations. While the Department is not required to comply with state and local building codes, laws and ordinance, the planning, design, and construction processes should accommodate them to the extent consistent with the accomplishment of the Department's mission.

0101-1 GENERAL

State, municipal, county and other local bulding and zoning codes and ordinances should be reviewed for possible conflicts with these criteria. While it is not mandatory that DOE projects comply with such local codes and regulations, the design professional is encouraged to cooperate with local officials and DOE personnel to accommodate the intent of local codes and regulations as much as possible.

These criteria apply to any building acquisition, new facility, facility addition and alteration, and leased facility that is required to comply with DOE 4300.1B. This includes on-site constructed buildings, pre-engineered buildings, plant-fabricated modular buildings and temporary facilities. For existing facilities, original design criteria apply to the structure in general; however, additions or modifications shall comply with this Order and the associated latest editions of the references herein.

0101-2 CRITERIA DEVIATIONS

DOE organizations with first-line responsibilities for facility projects shall determine to what extent these criteria shall be applied to projects in process under prior issuances of DOE 6430.1. In making this determination for projects already in the planning, design, construction, operating or decommissioning phases, consideration shall include the current stage of budgeting, design or costruction and the potential cost and schedule effects of applying these criteria.

For all projects subject to DOE 6430.1 series, these criteria are not intended to impose unnecessary design restrictions or requirements or to discourage design innovation. Professional architectural and engineering judgement shall be used in the interpretation and application of these criteria to specific projects.

1540-1.5 SAFETY DEVICES

As directed by project criteria, emergency eye washes, emergency showers or combination emergency eye wash-showers shall be provided in areas where corrosive or other skin or eye irritant chemicals are stored, handled, used or dispensed. Equipment shall comply with ANSI Z358.1 and be serviced by the potable water system.

Backflow preventers and air gaps shall be used to prevent cross connection (contamination) of potable water supplies. Vacuum breakers (to prevent back-siphonage) shall be used only in conjunction with administrative controls.

INTEROFFICE CORRESPONDENCE

DATE March 23, 1990
TO P. J. Suniewick
FROM R. C. Lerche *RCL*
SUBJECT BACKFLOW PREVENTERS

RCL-1(76)-90

You have asked me whether Plant facilities must contain backflow preventers to prevent cross contamination.

My review of DOE Order 6430.1A indicates that the quality of domestic water within distribution systems shall be protected from degradation by installation of backflow prevention assemblies, as necessary, to preclude backflow of contaminants or pollutants into the system. (See p. 2-33)

This Order also states that "[d]omestic water conveyed within distribution systems that serve DOE facilities shall comply with the applicable SDWA (Safe Drinking Water Act), 40 CFR 141, 40 CFR 142 requirements and with all other State, regional and local requirements."

I have reviewed the Colorado Revised Statutes and can find no provision which explicitly requires backflow preventers. Even if some state provision did exist it would not be directly applicable, as a matter of state law, to the Plant's water system unless a federal statute expressly made it applicable (i.e., a "waiver of sovereign immunity"). While the Safe Drinking Water Act contains a waiver of sovereign immunity, it applies only to "federally owned or maintained public water systems" (42 USC 300j-6). The term "public water system" is defined at 42 USC 300f and means "a system for the provision to the public of piped water for human consumption . . ." (emphasis added). It is beyond dispute that the Plant does not supply drinking water to the public. Consequently, I believe the Safe Drinking Water Act and any state law or local ordinance not to be directly applicable. Notwithstanding this conclusion, the DOE Order states these requirements must be followed. The significance of the foregoing is this: failure to implement any SDWA, state or local requirements would be contrary to the DOE Order only and therefore enforceable only through the DOE/EG&G contract.

Therefore, my advice concerning backflow preventers is this:

1. identify the 40 CFR 141, 142 requirements (I can provide these, if needed);
2. identify any "State, regional and local" requirements;
3. incorporate these requirements into the design of future facilities;
4. ask DOE if they intend for us to retrofit existing facilities.

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RADIOLOGICAL ENGINEERING EVALUATION
OF EMPLOYEE SUGGESTION 90-012

Employee suggestion 90-012 expresses a concern that airborne radioactive contamination will be drawn through emergency shower heads when the system is drained for maintenance and thus be drawn into the drinking water lines and distributed to water fountains and showers connected to the same line. The contention is that the vacuum created when the system is drained will draw particulate matter in through the shower head and all the way down a pipe to a sanitary shower or water fountain.

FINDING: Radiological Engineering has determined that the risk of this scenario occurring is virtually non-existent due to the following reasoning:

1. The airborne concentrations in the process area have never approached a level where this sort of penetration is possible.
2. The emergency showers have valves to actuate them. This valve acts as a barrier to any particulate matter entering the pipe.
3. The airborne behavior of the radioactive particulate encountered onsite precludes their migration up to an inverted surface and into very small orifices.
4. In the postulated scenario that a particle entered the head the possibility of it traversing the piping runs, which are wet and elbowed, without plating out on the interior is virtually non-existent.
5. When the system is drained no venting should occur at the shower heads since they are valved off by the actuator valve. Venting will occur at the first installed vent pipe which will leave a slug of water in the pipes that are not vented.
6. In the postulated scenario that the shower heads did draw a vacuum this vacuum would have to be significantly greater in flow, constant in nature, and lasting over a long period of time than that of the room negative pressure to cause particle migration to the head. This seems highly unlikely since the holes in the shower head are very small and thus cause significant flow restriction.
7. If the system is inoperable due to maintenance or draining why would a person attempt to use the system knowing that there is no water.

7. If the postulated incident did occur the following things would have to occur simultaneously:
 - a. Incredibly high concentrations of airborne radioactivity in extremely small particle size.
 - b. Draining of the system.
 - c. The high airborne occurring in the immediate vicinity of the heads.
 - d. The vacuum being high enough to force activation of the shower actuation valve or actuation of the shower.

Due to the above reasoning Radiological Engineering recommends that no modifications to the existing system be made and that the present system does not pose any measurable risk to personnel.

Although the above concern does not identify a hazard that needs correction it does illustrate that the employees are aware that when a controlled system or environment comes into contact with an uncontrolled system or environment there is a potential for cross contamination. In this instance the cross contamination is highly improbable. The identification of these potential problems should be continually encouraged and supported. The persons submitting this concern should be thanked for their participation in the program and encouraged to continue participating.

Joseph M. Harverson
Radiological Engineering
January 22, 1990

cc. P. Suniewick
T. Foppe