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TITLE

DESIGN CRITERIA
FIRE AND SANITARY WATER MODIFICATIONS
PROJECT CGI-141 REACTOR PLANT DEACTIVATION

ISSUING FILE

AUTHOR

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HW--82188

DE91 001205

DISTRIBUTION

	NAME	BUILDING	AREA
1-16.	AEC-RL00: RL Plum	703	700
17.	TW Ambrose	1760	100-D
18.	ER Astley	1704	100-H
19.	RE Baars	1704	100-D
20.	JW Baker	1704	100-F
21.	JW Ballowe	1704	100-F
22.	RS Bell	1704	100-H
23.	JL Boyd	328	300
24.	RF Corlett	T-26	WB
25.	DM Diediker	1704	100-F
26.	EL Etheridge	1704	100-F
27.	WJ Ferguson	1704	100-B
28.	G Fiorelli	1761	100-H
29.	LP Forby	1760	100-H
30.	SM Graves	1760	100-D
31.	OH Greager	1704	100-H
32.	CN Gross	1704	100-D
33.	HW Heacock	1704	100-F
34.	JW Hedges	1717	100-D
35.	AW Hervin	1704	100-F
36.	DS Jackson	328	300
37.	RT Jessen	1704	100-H
38.	G Kligfield (5)	760	700
39.	CE Lange	1704	100-B
40.	TH Lyons	1707	100-B
41.	GL Madsen	1704	100-D
42.	AR Maguire	1704	100-K
43.	WW McIntosh	1713	100-F
44.	SL Nelson	1704	100-F
45.	RS Peterson	1704	100-B
46.	WW Porter	T-26	WB
47.	RW Reid	1704	100-D

	NAME	BUILDING	AREA
48.	HC Riches, Jr.	328	300
49.	OC Schroeder	1704	100-H
50.	RM Scott	1704	100-F
51.	W Seeburger	1704	100-B
52.	CC Steele	762	700
53.	AP Vinther	1761	100-H
54.	GE Wade	762	700
55.	WW Windsheimer	1704	100-H
56.	300 Files	3760	300
57.	Records Center	712	700
57-66	Extras		

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DESIGN CRITERIA
FIRE AND SANITARY WATER MODIFICATIONS
PROJECT CGI-1+1 REACTOR PLANT DEACTIVATION

Prepared by CC Steele
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Design Engineering
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Date 6-9-64

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FACILITIES ENGINEERING SECTION

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MANUFACTURING SECTION

ATOMIC ENERGY COMMISSION CONCURRENCE

Date 8/27/64

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DESIGN CRITERIA
FIRE AND SANITARY WATER MODIFICATIONS
PROJECT 181-1 REACTOR PLANT DEACTIVATION

I. INTRODUCTION

Water for fire and sanitary use in the older reactor areas is provided by pumps located in the 183 building of each particular area. Each area has two electrically driven pumps for normal use and two steam driven pumps in case of power failure. Distribution within an area is through an underground main loop with laterals to buildings and fire hydrants.

When the DR, F and H Reactors are deactivated, fire and sanitary water in each area is still necessary for protection of the area and for certain peripheral facilities which can not be moved immediately to other locations. In D area, deactivation of the DR Reactor will not affect the fire and sanitary water system but in F and H areas, deactivation of the reactors will cut off the source of fire and sanitary water unless 181 river pumps, 182 filter plants and the 184 power houses are kept in operation.

II. PURPOSE

The purpose of these design criteria is to describe the scope of work and operational and technical requirements for conversion of the export water line between D and F areas to a fire and sanitary main to supply water from D area to F and H areas.

III. GENERAL REQUIREMENTS

The following code and standards are applicable for the design and installation:

1. American Water Works Association. AWWA, Standards and Specifications for Water Supply, Treatment, Distribution System, Storage Equipment, Materials and Procedures.
2. Hanford Atomic Products Operation Standards

IV. FUNCTIONAL REQUIREMENTS

The objective is to furnish to each deactivated area fire and sanitary water in a system which has capacity equal to the present systems. Sanitary water usage for deactivated areas will be less than present but will still be substantial because of the peripheral facilities remaining in the area. Required capacity for fire protection will be undiminished in each area; however, design will be based on a disaster occurring in only one deactivated area at a time.

V. DESCRIPTION OF WORKA. General

The scope of work described herein is contingent upon both F and H Reactors being deactivated and upon other project work for adequate coolant backup to remaining small reactors. When the D to F leg of the export system is no longer required, conversion to a fire and sanitary main can be accomplished.

B. Separation of D to F Leg of Export System

This part of the export system is a 30" concrete underground line approximately five miles long between D and F Areas with a tee in the line to H Area. The distance from the tee to H Area is just short of two miles. The 30" concrete line has a valve in the line near the junction with the 42" line from D to B Areas.

The D to F leg described above shall be completely separated from the export system by closing the valve at D Area and breaking the line. Separation is also required just inside the 182-F and 182-H Buildings and ahead of 105-F and 105-H where tie-ins to the existing sanitary water systems are to be made. End anchorage shall be provided as required and freezing protection provided.

C. Tie-Ins to Fire and Sanitary Water Systems

In D Area, an existing 6" line for sanitary water to the badge house crosses the 30" export line. A short tie-in with a valve between these lines will provide a source of supply to the proposed water main and at the same time will improve the quality of water to the badge house which is now somewhat stagnant. The tie line will not be equivalent to the 10" mains existing in the reactor areas so another tie line is proposed. A new tie line with valve shall be located which will tend to distribute the flow from 183-D around each side of the DR fire and sanitary loop.

Tie-ins at F and H Areas shall consist of new lines and valves between the existing export water line and the fire and sanitary water line. The new tie line in each area shall be located near the 183 Building so as to not change the pressure distribution within the area. At the time service in an area with the new system is restored, pumps in the 183 Building shall be disconnected and the lines capped outside the building.

DISCLAIMER

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

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D. Pumping Capacity at 183-D

The two electric pumps at D area are 300 gpm at 175 ft. head with 20 HP motors. For comparison, F and H area electric pumps are slightly larger being 350 gpm at 220 ft head with 25 HP motors and 300 gpm at 231 ft head with 30 HP motors, respectively. Normal operation per area is to run one electric pump. A flow test on July 19, 1963 at F area indicated 350 gpm usage. On August 2, 1963 at H area, the usage was 125 gpm and on September 27, 1963 at D area it was 280 gpm. At the time of the tests one pump was being run at F and H but both electric pumps were running at D.

Estimated normal water demand for D area and remaining facilities in F and H areas is 500-600 gpm which is approaching the capacity of the two pumps at D. It is proposed that one electric pump be replaced with an existing electric pump of higher capacity. The best replacement located to date is either one of the filtered water supply pumps to the power house at F or H. These pumps are identical being 1000 gpm at 165 ft. head with 60 HP motors. One of these would pump enough water at sufficient pressure to normally serve all three areas. Friction loss in the line between areas is small due to the large diameter of the pipe. Since D area is roughly 40 ft. higher in elevation than F and H, water pressure in each area will not be altered appreciably from the higher head pumps now in use at F and H.

E. High Tanks

The high tank on the fire and sanitary water system in each area is heated by steam, during freezing weather, from the 184 power house. Deactivation of reactors will not affect the steam supply in D area but will cut off the supply in F and H areas. The F area high tank shall be supplied with steam from the proposed packaged boiler installation serving the animal farm. The high tank in H area is located too far from the proposed packaged boiler serving the administration and central shops area to supply steam to the high tank. The high tank in H area shall be disconnected from the system and storage capacity shall be available from D and F high tanks.

F. Filtered Water Supply to 108-F

The filtered water currently being used at 108-F building for condenser cooling in refrigeration equipment shall be changed to fire and sanitary water by disconnecting the 2 $\frac{1}{2}$ " supply line outside the building and reconnecting to the 10" fire and sanitary loop.

G. Pressure Tests and Disinfecting

Before the export line is put in service as a fire and sanitary water main, it shall be pressure tested and if not in good condition the leaks shall be repaired. All lines which have been altered or modified shall be disinfected in accordance with Hanford Standard HW-4966-S, especially the export line. Draining the line at F and H areas, does not empty the line of raw water because of low spots between D and F areas.

VI. ACCEPTANCE TESTS AND AS BUILT DRAWINGS

The design shall include acceptance tests to be followed after installation within an area is complete that will demonstrate that flows and pressures are adequate. Drawings shall be corrected as necessary to reflect "as built" conditions for all alterations and modifications.

VII. REFERENCES

1. Project Proposal - Reactor Plant Deactivation - Project CGI-141, dated May 4, 1964.
2. Design Criteria for Packaged Boiler Installations, dated June 30, 1964.

END

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