SEQUENCE OF OPERATION:

1) GENERAL:

IN THE NORMAL OPERATING MODE, TWO HOT WATER PUMPS SHALL BE ENERGIZED BY THE CONTROL SYSTEM AND SHALL RUN CONTINUOUSLY. SELECTED PUMP STATUS, THRU THE DIFFERENTIAL PRESSURE SWITCH (DPS) SHALL BE REPORTED TO THE CONTROL SYSTEM. SHOULD A NORMALLY OPERATING PUMP FAIL TO START OR FAIL DURING OPERATION, THE CONTROL SYSTEM SHALL DE-ENERGIZE THE NORMALLY OPERATING PUMP AND SEND A SIGNAL TO ENERGIZE THE STANDBY PUMP.

2) BOILER OPERATION:

THE BOILERS SHALL BE MANUALLY ENERGIZED AT THE BEGINNING OF EACH HEATING SEASON UTILIZING THE UNIT CONTROL PANEL (UCP). THE UNIT CONTROL PANEL SHALL MODULATE THE GAS BURNER AS REQUIRED TO MAINTAIN BOILER WATER TEMPERATURE. A SIGNAL FROM THE UCP SHALL REPORT BOILER ENERGIZATION TO THE CONTROL SYSTEM. WHEN A BOILER IS ENERGIZED, THE CONTROL SYSTEM SHALL OPEN THE ASSOCIATED BOILER ISOLATION VALVE. A SIGNAL FROM EACH UCP SHALL REPORT BOILER ALARMS (THRU A SINGLE GENERAL ALARM) TO THE CENTRAL CONTROL STATION.

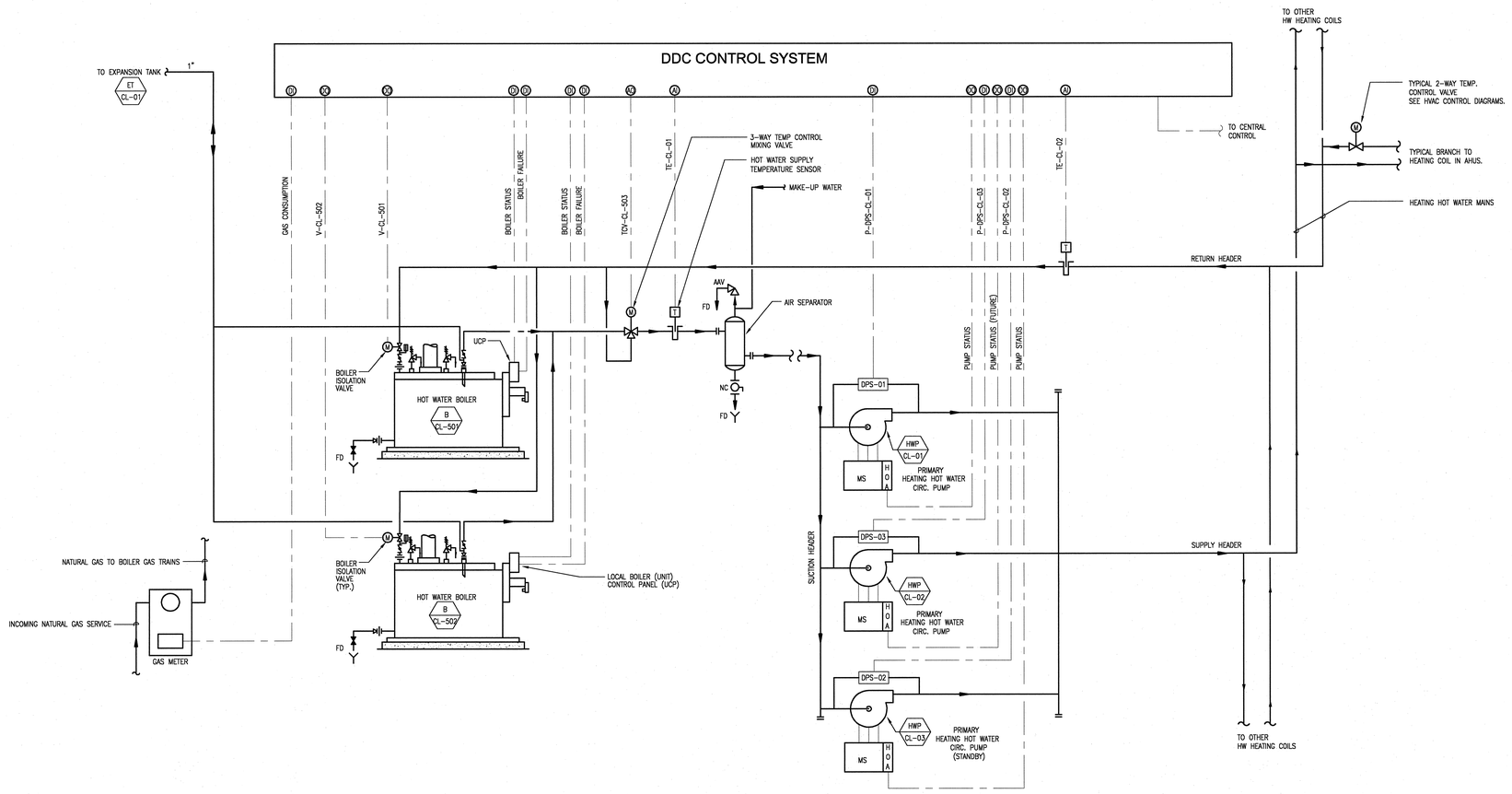
3) HOT WATER SUPPLY TEMPERATURE:

A SENSOR IN THE HOT WATER SUPPLY LINE SHALL REPORT SUPPLY TEMPERATURE TO THE CONTROL SYSTEM. THE CONTROL SYSTEM SHALL MODULATE 3-WAY CONTROL VALVE TCV-CL-503 AS REQUIRED TO MAINTAIN THE HOT WATER RESET SCHEDULE BELOW.

HW RESET SCHEDULE	
OA TEMP °F	HWS TEMP °F
13	180
65	140

CONTROL POINT LIST - CLO HEATING WATER SYSTEM

CENTRAL LAB OFFICE BUILDING	CONNECTED POINTS																			SOFTWARE										
	OUTPUT							INPUT												ALARMS					APPLICATIONS					
	DIGITAL			ANALOG				DIGITAL					ANALOG							DIGITAL		ANALOG								
POINT DESCRIPTION	GRAPHIC DISPLAY (WINDOWS BASED SOFTWARE)	CONTROL RELAY	HAND/OFF/AUTO	OPEN / CLOSE	CONTROL POINT ADJUSTMENT	PROPORTIONAL CONTROL	OPEN / CLOSE	PULSE	DIFFERENTIAL PRES. SWITCH	PRESSURE SWITCH	AUXILIARY CONTACT	GENERAL ALARM	TEMPERATURE (F)	% RELATIVE HUMIDITY	PSIG, PSIA, PSID	POSITION SENSOR	FLOW	CONTACT CLOSURE		HIGH LIMIT	LOW LIMIT	RUN TIME		DUTY CYCLING	START / STOP	CONVERT TO REST/AUTO	REHEAT COIL RESET	LEAD / LAG	CHILLED WATER RESET	FAILURE MODE
SYSTEM GRAPHICS	X																													
BOILER STATUS/ALARM, B-CL-501											X											X								X
BOILER STATUS/ALARM, B-CL-502																														
HOT WATER CIRCULATING PUMP, HWP-CL-501		X							X													X			X					
HOT WATER CIRCULATING PUMP, HWP-CL-502		X							X													X			X					
HOT WATER CIRCULATING PUMP HWP-CL-503 (STANDBY)		X							X													X								
THREE WAY TEMPERATURE CONTROL VALVE, TCV-CL-503						X																								
HOT WATER SUPPLY TEMPERATURE, TE-CL-01													X																	
HOT WATER RETURN TEMPERATURE, TE-CL-02													X																	
BOILER B-CL-501 ISOLATION VALVE V-CL-501				X																										
BOILER B-CL-502 ISOLATION VALVE V-CL-502				X																										
NATURAL GAS CONSUMPTION								X																						



CENTRAL LAB/OFFICE BLDG - HEATING HOT WATER SYSTEM CONTROL DIAGRAM

NO SCALE

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NUMBER OF SECTION OR DETAIL — DRAWING ON WHICH SECTION OR DETAIL IS SHOWN OR TAKEN

SECTION AND DETAIL KEY

THIS DOCUMENT CONTROLLED BY

CHANGE CONTROL SYSTEM 4

ENGINEERING PROCEDURE SNS-ENG-0001

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE CONTROL NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE
0				CERTIFIED FOR CONSTRUCTION – MAY 15, 2001	RTW	KJH				11/1/01		9/4/01				10/8/01	BWJ	105869	10/8/01

REVISION OR ISSUE PURPOSE — REVISION APPROVALS

SC	AW	WRS	RL	WRS	BWJ	--	WRS	--	WAS
ST	CV	EC	EE	EM	IE	M	PD	SE	AR

SQUAD CHECK

RPE: BRUCE W. JOHNSON, REGISTERED ENGINEER, AGRICULTURE, COMMERCE, STATE OF TENNESSEE

DSN	S. VERECZEY	05/15/01
DRW	M. THAW	05/15/01
CHK	B. JOHNSON	05/15/01
DEPT		
PE		10/1/01
PJ		9/21/01
REQ		
UTB		10/8/01

0 REV. 5/14/01 DATE — DRAWING APPROVALS

108031400-H8E-8600-A092

Knight Jacobs — Knight/Jacobs Joint Venture, 701 Scarboro Road, MS 8253, Oak Ridge, TN 37830, 865-241-9433, fax 865-241-3400

KNIGHT — Knight Advanced Technology, 549 West Randolph Street, Chicago, IL 60661

UT-BATTELLE — Oak Ridge National Laboratory managed for the DEPARTMENT OF ENERGY under U.S. GOVERNMENT contract DE-AC05-00OR22725, UT-BATTELLE, LLC. ◆ Oak Ridge, Tennessee

PROJECT NAME:

SPALLATION NEUTRON SOURCE

CENTRAL LAB AND OFFICE BUILDING
HVAC-HEATING WATER CONTROLS
HOT WATER - BOILER SYSTEM

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	H	X	X	8	8600		1	1	D	U
51		52		53	WBS		REV			
NC		NA			1.8.3.14		H8.10.44			0

AutoCAD