PAUL SCHERRER INSTITUT

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PANDA Transient Tests

M7 Integral System Test Procedure

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Abstract:

This report details the procedure for conducting PANDA Transient Tests M7 specified by GE document 25A5764 Rev.3.

All phases for PANDA operation during the preconditioning processes and the test phases are described.

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00 Introduction

The following procedure describes all test phases for Transient Tests M7, including preconditioning processes. Assuming that the starting point for the preconditioning is an empty facility at atmospheric conditions, this procedure gives sequences of processes, which do not need to be strickly followed during the preconditioning process, at the discretion of Test Engineer. Required phases are listed in the Checklist and must be recorded when conducted.
The current procedure gives guidance on how to proceed to bring PANDA to the required initial test conditions for a extreme case (from a cold and empty facility). The order of preconditioning sequences may be modified if needed, and single phases may be adapted to the actual conditions. Heating power indicated in preconditioning phases is theoretical and considered as basis for time estimation; the given values correspond to the highest heater performances. Due to PSI electrical power limitation or modification in preconditioning process, the heating power may be reduced.
In any case, the foreseen preconditioning process is to start with the Suppression Chambers conditioning after the facility has been set ready for operation. It continues with the GDCS tank, all PCC condenser pools and the Drywells. Just before test initiation, the RPV is set up to satisfy the required initial conditions. The test is then conducted during 5 hours under automatic power control and without any operator action.
A time estimation for the preconditioning of an empty and cold facility is given for each component in the following table.
Test Plan Specifications are described in the GE document 25A5764 REV.3.

Note:
- Since temperatures are given in Kelvin in the Test Plan Specification and in °C in the whole PANDA DAS, they are indicated in both units in that current procedure.
- Key parameters or key actions are indicated in dark frames to make reading easier during PANDA operation.

Time Estimation

Phase n°	Preconditioning Phases	time
10	Initial Alignment	not estimated
20	RPV Setup for Vessel Preconditioning	5,8 [hour]
30	Suppression Chambers Setup	12,2 [hour]
40	GDCS Heating	1,6 [hour]
50	PCC1 Pool Setup	1,9 [hour]
60	PCC2 Pool Setup	1,9 [hour]
70	PCC3 Pool Setup	1,9 [hour]
80	Drywells Setup	not estimated
90	RPV Initial Conditions Setup for Test	0,3 [hour]
100	Test Conditions Setup	not estimated
110	Test	5,0 [hour]
10 to 100	Duration for Preconditioning	25,3 [hour]
10 to 110	Duration for the whole Test	30,3 [hour]

Note: Duration of the phases n° 10, 80 and 100 cannot be estimated, it should not exceed a couple of hours.

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01 Test Configuration and Initial Conditions

The configuration for the Transient Test M7 includes the RPV, Suppression Chambers, Drywells, GDCS, all PCC condensers and their respective pools; the IC condenser and the IC pool is not included to the Test configuration. The Equialization Lines connecting both Wetwells to the RPV are closed. A detailed description of the required configuration is given in the above mentioned GE document "Test Plan Specification".
An overview of the test configuration is summarized in the list of Test Initial Conditions given in the following. Defined for all components involved for Transient Tests, these Initial Conditions described in the above mentioned GE document are listed below with the respective tolerances.

Note: The current procedure is based on the values given in the Test Initial Conditions List below.

Test Initial Conditions List

RPV (V.RP)

- Total Pressure	MP.RP.1 =	131 [kPa]	±	4 [kPa]
- Mean Fluid Temperature	$T_{F\_mean}(RP)$ =	Σ(MTF.RP.j)/max(j)		with j = 1 to 5
	$T_{F\_mean}(RP)$ =	380 [K]	±	2 [K]
- Local Fluid Temperature	MTF.RP.1...5 =	$T_{F\_mean}(RP)$	±	2 [K]
- Water Level	ML.RP.1 =	12,7 [m]	±	0,20 [m]

Drywell 1 and 2 (V.D1 - V.D2)

- Air Partial Pressure	MPG.D1.1 =	131 [kPa]	±	8 [kPa]
	MPG.D2.1 =	131 [kPa]	±	8 [kPa]
- Mean Gas Temperature	$T_{G\_mean}(D1)$ =	Σ(MTG.D1.j)/max(j)		with j = 1 to 6
	$T_{G\_mean}(D2)$ =	Σ(MTG.D2.j)/max(j)		with j = 1 to 6
	* $T_{G\_mean}(D1)$ =	300 [K]		
	* $T_{G\_mean}(D2)$ =	300 [K]		
- Local Gas Temperature	MTG.D1.1...6 =	$T_{G\_mean}(D1)$	±	2 [K]
	MTG.D2.1...6 =	$T_{G\_mean}(D2)$	±	2 [K]
- Water Level	ML.D1 =	0 [m]	±	0,10 [m]
	ML.D2 =	0 [m]	±	0,10 [m]

Note: * The temperature defined for the Drywells correspond to the room temperature; it might be different than the value indicated.

Suppression Chamber 1 and 2 (V.S1 - V.S2)

-Total Pressure	MP.S1 =	131 [kPa]	±	4 [kPa]
	MP.S2 =	131 [kPa]	±	4 [kPa]
- Mean Gas Temperature	$T_{G\_mean}(S1)$ =	Σ(MTG.S1.j)/max(j)		with j = 1 to 6
	$T_{G\_mean}(S2)$ =	Σ(MTG.S2.j)/max(j)		with j = 1 to 6
	$T_{G\_mean}(S1)$ =	352 [K]	±	2 [K]
	$T_{G\_mean}(S2)$ =	352 [K]	±	2 [K]
- Local Gas Temperature	MTG.S1.1...6 =	$T_{G\_mean}(S1)$	±	2 [K]
	MTG.S2.1...6 =	$T_{G\_mean}(S2)$	±	2 [K]
- Mean Water Temperature	$T_{W\_mean}(S1)$ =	Σ(MTL.Sn.j)/max(j)		with j = 1 to 6
	$T_{W\_mean}(S2)$ =	Σ(MTL.S2.j)/max(j)		with j = 1 to 6
	$T_{W\_mean}(S1)$ =	352 [K]	±	2 [K]
	$T_{W\_mean}(S2)$ =	352 [K]	±	2 [K]
- Local Water Temperature	MTL.S1.1...6 =	$T_{W\_mean}(S1)$	±	2 [K]
	MTL.S2.1...6 =	$T_{W\_mean}(S2)$	±	2 [K]
- Water Level	ML.S1 =	3,8 [m]	±	0,10 [m]
	ML.S2 =	3,8 [m]	±	0,10 [m]

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Test Initial Conditions List (cont'd)

GDCS (V.GD)

-Total Pressure	MP.GD =	131 [kPa]	±	4 [kPa]
- Mean Fluid Temperature	$T_{F\_mean}(GD)$ =	Σ(MTF.GD.j)/max(j)		with j = 1 to 7
	$T_{F\_mean}(GD)$ =	333 [K]	±	2 [K]
- Local Fluid Temperature	MTF.GD.1...7 =	$T_{F\_mean}(GD)$	±	2 [K]
- Water Level	ML.GD =	0 [m]	±	0,10 [m]

PCC1, 2 and 3 Pools (V.U1 - V.U2 - V.U3)

-Total Pressure	* MP.ENV =	97 [kPa]		
- Mean Water Temperature	$T_{W\_mean}(U1)$ =	Σ(MTL.U1.j)/max(j)		with j = 1 to 7
	$T_{W\_mean}(U2)$ =	Σ(MTL.U2.j)/max(j)		with j = 1 to 7
	$T_{W\_mean}(U3)$ =	Σ(MTL.U3.i)/max(i)		with i = 1 to 19
	* $T_{W\_mean}(U1)$ =	372 [K]	+0/ -4	[K]
	* $T_{W\_mean}(U2)$ =	372 [K]	+0/ -4	[K]
	* $T_{W\_mean}(U3)$ =	372 [K]	+0/ -4	[K]
- Local Water Temperature	MTL.U1.1...7 =	$T_{W\_mean}(U1)$	±	2 [K]
	MTL.U2.1...7 =	$T_{W\_mean}(U2)$	±	2 [K]
	MTL.U3.1...19 =	$T_{W\_mean}(U3)$	±	2 [K]
- Water Level	ML.U1 =	4,8 [m]	±	0,20 [m]
	ML.U2 =	4,8 [m]	±	0,20 [m]
	ML.U3 =	4,8 [m]	±	0,20 [m]

Note: * The pressure and temperature defined for the PCC Pools correspond to saturation values at usual atmospheric pressure at the test site.

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10 Initial Alignment

Before starting any preconditioning process, the facility is set into the specific state which establishes operations from the control room. The configuration is set in order to avoid any unintentional hardware manipulation during testing or preconditioning. The Data Acquisition and Control System must be properly initiated and brought into operation. Valves are aligned in accordance to STARTUP Status, automatic heat power regulation files are loaded and the auxiliary water system is filled to allow pump operation.
Four different preparation phases are needed for the Transient Test M7: phase n°11 starting Control and Data Acquisition Systems, phase n°12 for the initial valve setup, phase n°13 for the configuration checking and phase n°14 for auxiliary water system filling.

11 Control System and DAS Setup

- Ethernet connection is isolated from PSI network (Unplug Ethernet connector)
- Run Factory Link software on HP-UNIX workstation (cf. Trending System User's Guide)
- Run DAS software (cf. DAS User's Guide)
- Run Factory Link software on PC (cf. Control Syst. User's Guide)
- Switch all local controllers to "external" and "automatic" state

Record on attached checklist

12 Valve Alignment

- Valve off for pressure difference transmitters
- Set valve positions according to the STARTUP status

Record on attached checklist

13 General Facility Configuraton Check

- Check that the facility configuration corresponds to the required test configuration

Record on attached checklist

14 Auxiliary Water System Filling

- Fill the Auxiliary Water System

15 Instrument / Zero Check

15.0 - Turn On Oxygen Probes

15.1 - Check Instruments

Transmitter zero check and DAS reading check according to the actual facility state, recording on DAS-Reading Hard-Copy and Trending Plots.

Record on attached checklist

20 RPV Setup for Vessel Preconditioning

As the heat source for the whole preconditioning process, the RPV must be capable of producing steam for vessel heating or providing hot water to the auxiliary system. In order to establish conditions to generate steam, the RPV is first heated to 373K, while most of the air is purged by venting to the atmosphere. Not all air is purged at this temperature, but that does not affect vessel preconditioning. Pure steam conditions are only required for the tests. Then the RPV is heated to about 440K to supply the auxiliary water system heat exchanger.
The RPV water level is set before preconditioning to anticipate evaporation occuring during heating by steam injection; it should reach the required Test water level at the end of the preconditioning process. However in any case it must be lower than the main steam line inlets to avoid water hammer.

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21 Water Filling

21.0 Monitor RPV Parameters — Assumption:
- Water Level — ML.RP.1 = 0,0 [m]
M(RPV-water) = 0,00 [ton]

21.1 Supply water until water reaches level equal to 12,2 [m]

Vent Air to the Atmosphere
- Open valve CC.RPV

Auxiliary water system operation
Pump MP.B0D On — MV.B0D = 2,0 [l/s]
ML.RP.1 = 12,2 [m] — M(RPV-water) = 15,00 [ton]
=> time = 7500 [sec]

Pump MP.B0D Off

Fill preheater heating side with water
- Open valve CB.HRH, CB.HFH

21.2 Monitor RPV Parameters
- Water Level — ML.RP.1 = 12,2 [m]

22 Heating / Purging

22.0 Monitor RPV Parameters

Assumptions:
- Total Pressure — MP.RP.1 = 101 [kPa]
- Local Fluid Temperature — MTF.RP.1...5 = 283 [K] = 10 [°C]
- Structure temperature — MTI.RP.1...3 = 283 [K] = 10 [°C]
- Water Level — ML.RP.1 = 12,2 [m]

22.1 Heat until temperature equals 373 [K]

Heaters On
MW.RP.7 = 800 [kW]
MTF.RP.1...5 = 373 [K] — => ΔT = 90 [K]
= 100 [°C]
M(RPV-water) = 15,00 [ton] — => ΔQ = 5,67 [GJ]
M(RPV-struct) = 8,00 [ton] — => ΔQ = 0,36 [GJ]
=> ΔQtot = 6,03 [GJ]
=> time = 7539 [sec]

- Close valve CC.RPV

22.2 Heat until temperature equals 441 [K]
* MTF.RP.1...5 = 441 [K] — => ΔT = 68 [K]
= 168 [°C]

Note: * Temperature corresponding to the heat exchanger operation.

M(RPV-water) = 15,00 [ton] — => ΔQ = 4,28 [GJ]
M(RPV-struct) = 8,00 [ton] — => ΔQ = 0,27 [GJ]
=> ΔQtot = 4,56 [GJ]
=> time = 5696 [sec]

Heater Off

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22.3 Monitor RPV Parameters

- Total Pressure	MP.RP.1 =	746 [kPa]	(Psat)	
- Local Fluid Temperature	MTF.RP.1...5 =	441 [K]	=	168 [°C]
- Structure temperature	MTI.RP.1...3 =	441 [K]	=	168 [°C]
- Water Level	ML.RP.1 =	13,5 [m]		
	M(RPV-water) =	15,00 [ton]		

30 Suppression Chambers Setup

The Test Initial Conditions require a collapsed water level in both Suppression Chambers of 3,8m above the PANDA heater bundle, that corresponds to a water column of 3,8m from the bottom of the Suppression Chamber. The required temperature is a homogeneous temperature of 352K for the pool water as well as for the gas space. The total pressure, is at 131kPa, which includes, considering saturated conditions, an air partial pressure of 86kPa. Since the total pressure is quite equivalent to the atmospheric pressure, the pressurization process consists in venting to the atmosphere.
The Suppression Chambers Setup starts with water filling and pool conditioning (phase n° 31), continues with gas space heating by steam injection keeping one bar air partial pressure inside the vessels (phase n° 32). The total pressure is then setup by venting to the atmosphere (phase n° 33). Phase n° 33 is performed after phases n° 31 and 32 have been conducted.

31 Water Filling

31.0 Monitor SCs Parameters

Assumptions:

-Total Pressure	MP.S1 =	101 [kPa]		
	MP.S2 =	101 [kPa]		
- Local Water Temperature	MTL.S1.1...6 =	283 [K]	=	10 [°C]
	MTL.S2.1...6 =	283 [K]	=	10 [°C]
- Water Level	ML.S1 =	0 [m]		
	ML.S2 =	0 [m]		

31.1 RPV Setup for Heat Exchanger Operation

Monitor RPV Parameters

- Total Pressure	MP.RP.1 =	746 [kPa]	(Psat)	
- Local Fluid Temperature	MTF.RP.1...5 =	441 [K]	=	168 [°C]
- Water Level	ML.RP.1 =	13,5 [m]		

Heaters On

MW.RP.7 = 800 [kW]

31.2 Supply water until water reaches level equal to 3,8 [m]

Auxiliary water system operation
Pump PC.HFH On
Set up control valve CC.BHA

	MTL.BHA =	354 [K]	=	81 [°C]

CC.BCA

MTL.BCA =	max [K]	
MV.B0D =	2,1 [l/s]	
M(S1-water) =	42,50 [ton]	
M(S2-water) =	42,50 [ton]	
M(TSL-water) =	7,10 [ton]	
=> time =	43857 [sec]	

- Open valve CB.S1L
Pump PC.B0D On

ML.S1 =	3,8	[m]
ML.S2 =	3,8	[m]

- Close valve CB.S1L
Pump PC.B0D Off
Pump PC.HFH Off
Heater Off

MV.B0D = 0,0 [l/s]

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31.3 Monitor SCs Parameters

- Mean Water Temperature

$T_{w\_mean}(S1)$ = 352 [K] = 79 [°C]
$T_{w\_mean}(S2)$ = 352 [K] = 79 [°C]

- Water Level

ML.S1 = 3,8 [m]
ML.S2 = 3,8 [m]

32 Gas Space Heating

32.0 Monitor SCs Parameters

Assumptions:

-Total Pressure

MP.S1 = 162 [kPa]
MP.S2 = 162 [kPa]

- Local Gas Temperature

MTG.S1.1...6 = 283 [K] = 10 [°C]
MTG.S2.1...6 = 283 [K] = 10 [°C]

- Structure temperature

MTI.S1.1...9 = 283 [K] = 10 [°C]
MTI.S2.1...9 = 283 [K] = 10 [°C]

32.1 RPV Setup for Steam Injection

Monitor RPV Parameters

- Total Pressure

MP.RP.1 = 746 [kPa] (Psat)

- Local Fluid Temperature

MTF.RP.1...5 = 441 [K] = 168 [°C]

- Water Level

ML.RP.1 = 13,5 [m]

Heaters On

MW.RP.7 = 800 [kW]

32.2 Steam injection

- Open valve CB.S1S, CB.S2S

MTI.S1.1...9 = 352 [K]
= 79 [°C]
MTI.S2.1...9 = 352 [K]
= 79 [°C]

=> ΔT = 69 [K]

M(SCs-struct) = 72,7 [ton]
M(steam) = 1095 [kg]

=> ΔQ = 2,52 [GJ]
=> time = 3148 [sec]

- Close valve CB.S1S, CB.S2S

Heater Off

Monitor RPV Parameters

- Total Pressure

MP.RP.1 = 746 [kPa] (Psat)

- Local Fluid Temperature

MTF.RP.1...5 = 441 [K] = 168 [°C]

- Water Level

ML.RP.1 = 12,6 [m]

32.3 Monitor SCs Parameters

-Total Pressure

MP.S1 = 207 [kPa]
MP.S2 = 207 [kPa]

- Mean Gas Temperature

$T_{G\_mean}(S1)$ = 352 [K] = 79 [°C]
$T_{G\_mean}(S2)$ = 352 [K] = 79 [°C]

- Mean Water Temperature

$T_{W\_mean}(S1)$ = 352 [K] = 79 [°C]
$T_{W\_mean}(S2)$ = 352 [K] = 79 [°C]

- Water Level

ML..S1 = 3,8 [m]
ML.S2 = 3,8 [m]

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33 Pressurization

33.0 Monitor SCs Parameters
-Total Pressure

Assumptions:
MP.S1 = 207 [kPa]
MP.S2 = 207 [kPa]

33.1 Vent until pressure reachs 131 [kPa]
Set up control valve CC.S1V
- Close valve CC.S1V

MP.S1 = 131 [kPa]

33.2 Monitor SCs Parameters
-Total Pressure

MP.S1 = 131 [kPa]
MP.S2 = 131 [kPa]

- Mean Gas Temperature

$T_{G\_mean}(S1)$ = 352 [K] = 79 [°C]
$T_{G\_mean}(S2)$ = 352 [K] = 79 [°C]

- Mean Water Temperature

$T_{W\_mean}(S1)$ = 352 [K] = 79 [°C]
$T_{W\_mean}(S2)$ = 352 [K] = 79 [°C]

- Water Level

ML.S1 = 3,8 [m]
ML.S2 = 3,8 [m]

40 GDCS Heating

The Test Initial Conditions require a water level in the GDCS tank of 10,7m above the PANDA heater bundle, corresponding to a water level of 0,0m from the bottom of the tank, taking into account a full GDCS Return Line. The required temperature is a homogeneous temperature of 333K for the whole tank, which is achieved by filling with water up to approximately 5m at the required temperature and then draining the tank. The total pressure in saturated conditions and in equilibrium with the Drywell pressure is at 131kPa, which includes an air partial pressure of 101kPa. The pressurization process is performed after te GDCS has been drained, because water filling and water draining are performed by keeping the GDCS vent valve open.
The GDCS Setup starts with structure heating by steam injection (phase n° 41), continues with water filling and pool conditioning, while keeping the vent valve open, the air is vented to the atmosphere (phase n° 42). A pressure corresponding to the atmospheric pressure is automatically set up during water is drained to the PCC3 Pool (phase n° 43) and air is injected in order to establish the required test initial condition. These processes correspond to phases n° 71 and 72.

41 Gas Space Heating

41.0 Monitor GDCS Parameters

Assumptions:
- Total Pressure MP.GD = 101 [kPa]
- Local Fluid Temperature MTF.GD.1...7 = 283 [K] = 10 [°C]
- Structure temperature MTI.GD.1...6 = 283 [K] = 10 [°C]
- Water Level ML.GD = 0 [m]

41.1 RPV Setup for Steam Injection
Monitor RPV Parameters
- Total Pressure MP.RP.1 = 746 [kPa] (Psat)
- Local Fluid Temperature MTF.RP.1...5 = 441 [K] = 168 [°C]
- Water Level ML.RP.1 = 12,6 [m]

Heaters On
MW.RP.7 = 800 [kW]

Note: The RPV temperature must be reduced to 436K for the GDCS water filling operation (see 41.2 & 42.1)

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41.2 Steam injection

- Open valve CB.GDS

MTI.GD.1...5 = 333 [K] => ΔT = 50 [K]
= 60 [°C]

M(GD-struct) = 5,00 [ton] => ΔQ = 0,13 [GJ]
M(steam) = 54,6 [kg] => time = 157 [sec]

- Close valve CB.GDS

Heater Off

Monitor RPV Parameters

- Total Pressure	MP.RP.1 =	669 [kPa]	(Psat)	
- Local Fluid Temperature	MTF.RP.1...5 =	436 [K]	=	163 [°C]
- Water Level	ML.RP.1 =	12,4 [m]		

41.3 Monitor GDCS Parameters

-Total Pressure	MP.GD =	121 [kPa]		
- Local Fluid Temperature	MTF.GD.1...7 =	333 [K]	=	60 [°C]
- Structure temperature	MTI.GD.1...6 =	333 [K]	=	60 [°C]
- Water Level	ML.GD =	0 [m]		

Note: In order to get homogeneous temperature in GDCS, it is heated with water.

42 Water Filling

42.0 Monitor GDCS Parameters

-Total Pressure	MP.GD =	121 [kPa]		
- Local Fluid Temperature	MTF.GD.1...7 =	333 [K]	=	60 [°C]
- Structure temperature	MTI.GD.1...6 =	333 [K]	=	60 [°C]
- Water Level	ML.GD =	0 [m]		

42.1 RPV Setup for Heat Exchanger Operation

Monitor RPV Parameters

- Total Pressure	MP.RP.1 =	669 [kPa]	(Psat)	
- Local Fluid Temperature	MTF.RP.1...5 =	436 [K]	=	163 [°C]
- Water Level	ML.RP.1 =	12,4 [m]		

Heaters On

MW.RP.7 = 800 [kW]

42.2 Supply water until water reaches level equal to 5,5 [m]

Vent Gas to the Atmosphere

- Open valve CC.BUV, CB.GDV

Auxiliary water system operation

Pump PC.HFH On

Set up control valve CC.BHA MTL.BHA = 333 [K] = 60 [°C]
CC.BCA MTL.BCA = max [K]

Pump PC.B0D On MV.B0D = 2,9 [l/s]

- Open valve CB.GDL

ML.GD = 5,5 [m] M(GD-water) = 16,2 [ton]
=> time = 5595 [sec]

- Close valve CB.GDL

Pump PC.B0D Off

Pump PC.HFH Off

Heater Off

- Close valve CC.BUV, CB.GDV

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42.3 Monitor GDCS Parameters

-Total Pressure	MP.GD =	1232 [kPa]			
- Mean Fluid Temperature	T_{F_mean}(GD) =	333 [K]	=	60 [°C]	
- Structure temperature	MTI.GD.1...6 =	333 [K]	=	60 [°C]	
- Water Level	ML.GD =	5,50 [m]			

43 Pressurization

43.0 See phase n°72
Since the GDCS is full with water, it cannot be pressurized during the phase n° 43.
The GDCS pressurization is performed during phase n°72.

50 PCC1 Pool Setup

The Test Initial Conditions for all PCC Pools are the same; water level from the top of the PANDA heater bundle is defined at the highest possible level (23,6m), which corresponds to a water level of 4,8m in the pools. The end point temperature is near the saturation temperature for atmospheric pressure.
The Pools Setup is performed as follows: water is filled at the highest possible temperature (phase n° 51, 61 & 71) and the temperature conditions are adjusted then by circulation through the auxiliary heat exchanger (phase n° 101, 102 & 103).

Note: Similar phases can be performed simultaneously; pools can be connected and filled at the same time and water circulation can be also performed with connected pools.

51 Water Filling

51.0 Monitor PCC1 Pool Parameters

- Local Water Temperature	MTL.U1.1...7 =	283 [K]	=	10 [°C]
- Water Level	ML.U1 =	0 [m]		

51.1 RPV Setup for Heat Exchanger Operation
Monitor RPV Parameters

- Total Pressure	MP.RP.1 =	669 [kPa]	(Psat)	
- Local Fluid Temperature	MTF.RP.1...5 =	436 [K]	=	163 [°C]
- Water Level	ML.RP.1 =	12,4 [m]		

Heaters On
MW.RP.7 = 800 [kW]

* MTF.RP.1...5 = 436 [K] = 163 [°C] => ΔT = 0 [K]

Note: * Temperature corresponding to the heat exchanger operation. PCC1 Pool water filling

51.2 Supply water until water reaches level equal to 4,8 [m]
Auxiliary water system operation
Pump PC.HFH On
Set up control valve CC.BHA MTL.BHA = 375,3 [K] = 102 [°C]
CC.BCA MTL.BCA = *min [K]
Pump PC.B0D On MV.B0D = 2,0 [l/s]
- Open valve CB.U1L
ML.U1 = 4,8 [m] M(U1-water) = 13,93 [ton]
=> time = 6966 [sec]

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- Close valve CB.U1L

Pump PC.B0D Off
Pump PC.HFH Off
Heater Off

Note: * The temperature on the RPV side might be too high; a low flow in that side should help to reduce the temperature in the heatexchanger. If that flow reduction is not enough, the temperature in RPV must be reduced.

51.3 Monitor PCC1 Pool Parameters

- Mean Water Temperature	$T_{w\_mean}(U1)$ =	372 [K]	=	99 [°C]
- Water Level	ML.U1 =	4,80 [m]		

60 PCC2 Pool Setup

For PCC2 Pool Setup refer to description of pools conditioning in phase n°50.

61 Water Filling

61.0 Monitor PCC2 Pool Parameters

- Local Water Temperature	MTL.U2.1...7 =	283 [K]	=	10 [°C]
- Water Level	ML.U2 =	0 [m]		

61.1 RPV Setup for Heat Exchanger Operation
Monitor RPV Parameters

- Total Pressure	MP.RP.1 =	669 [kPa]	(Psat)	
- Local Fluid Temperature	MTF.RP.1...5 =	436 [K]	=	163 [°C]
- Water Level	ML.RP.1 =	12 [m]		

Heaters On
MW.RP.7 = 800 [kW]

61.2 Supply water until water reaches level equal to 4,8 [m]
Auxiliary water system operation
Pump PC.HFH On
Set up control valve CC.BHA MTL.BHA = 375,3 [K] = 102 [°C]
CC.BCA MTL.BCA = *min [K]
Pump PC.B0D On MV.B0D = 2,0 [l/s]
- Open valve CB.U2L
ML.U2 = 4,8 [m] M(U2-water) = 13,93 [ton]
=> time = 6966 [sec]

Note: * The temperature on the RPV side might be too high; a low flow in that side should help to reduce the temperature in the heatexchanger. If that flow reduction is not enough, the temperature in RPV must be reduced and water recirculated through the heatexchanger.

- Close valve CB.U2L
Pump PC.B0D Off
Pump PC.HFH Off
Heater Off

61.3 Monitor PCC2 Pool Parameters

- Mean Water Temperature	$T_{w\_mean}(U2)$ =	372 [K]	=	99 [°C]
- Water Level	ML.U2 =	4,8 [m]		

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70 PCC3 Pool Setup

For PCC3 Pool Setup refer to description of pools conditioning in phase n°50. In that case, the water comes from the GDCS; this phase defines the water transfer from GDCS to PCC3 pool. The water is heated by passing through the auxiliary heatexchanger, which process helps to cool down the RPV in order to appraoch the required test initial conditions for the RPV.
Since the required total pressure in GDCS higher than the atmospheric pressure, the GDCS vent valve is kept open during water is drained; the total pressure in the GDCS tank will be adjusted by air injection in phase n°72 (phase n° 71 & n° 72).

71 Water Transfer from GDCS Tank

71.0 Monitor PCC3 Pool Parameters

- Local Water Temperature	MTL.U3.1...19 =	283 [K]	=	10 [°C]
- Water Level	ML.U3 =	0 [m]		

Monitor GDCS Parameters

-Total Pressure	MP.GD =	101 [kPa]		
- Mean Fluid Temperature	T_{F_mean}(GD) =	333 [K]	=	60 [°C]
- Structure temperature	MTI.GD.1...6 =	333 [K]	=	60 [°C]
- Water Level	ML.GD =	5,50 [m]		

Monitor RPV Parameters

- Total Pressure	MP.RP.1 =	669 [kPa]	(Psat)	
- Local Fluid Temperature	MTF.RP.1...5 =	436 [K]	=	163 [°C]
- Water Level	ML.RP.1 =	12,4 [m]		

71.2 Supply water until water reaches level equal to 4,8 [m]

GDCS Pressurization
- Open valve CC.BUV, CB.GDV — MP.GD = 101 [kPa]

Auxiliary water system operation
* Heater Off MW.RP.7 = 0 [kW]
Pump PC.HFH On
Set up control valve — MTL.BHA = 375 [K] = 102 [°C]; MTL.BCA = max [K]
Pump PC.B0A On — MV.B0A = 2,0 [l/s]
- Open valve CB.U3U, CB.GDL
ML.U3 = 4,80 [m] — M(U3-water) = 13,93 [ton]; => time = 6966 [sec]

- Close valve CB.U3U, CB.GDL
Pump PC.B0D Off
Pump PC.HFH Off
Heater Off
- Close valve CC.BUV, CB.GDV

Note: * During that phase, the RPV, used as heat source for auxiliary water heatexchanger, is cooled down in order to appraoch the required test initial conditions - heater power is controlled (even not used) in order to decrease the RPV temperature.

71.3 Monitor PCC3 Pool Parameters

- Mean Water Temperature	T_{W_mean}(U3) =	372 [K]	=	99 [°C]
- Water Level	ML.U3 =	4,80 [m]		

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Monitor GDCS Parameters

-Total Pressure	MP.GD =	101 [kPa]		
- Mean Fluid Temperature	T_{F_mean}(GD) =	333 [K]	=	60 [°C]
- Structure temperature	MTI.GD.1...6 =	333 [K]	=	60 [°C]
- Water Level	ML.GD =	0,10 [m]		

Monitor RPV Parameters

- Total Pressure	MP.RP.1 =	262 [kPa]		
- Local Fluid Temperature	MTF.RP.1...5 =	399 [K]	=	126 [°C]
- Water Level	ML.RP.1 =	12,3 [m]		

72 GDCS Pressurization

72.0 Monitor GDCS Parameters

-Total Pressure	MP.GD =	101 [kPa]
- Mean Fluid Temperature	T_{F_mean}(GD) =	333 [K]
- Water Level	ML.GD =	0,1 [m]

72.1 Air injection until total pressure reachs 131 [kPa]

Auxiliary air supply system operation
Set up control valve CC.B0G.2 MM.B0G = max
Pump PC.HFH CB.S1G, CB.S2G, CB.B0G
MP.GD = 131 [kPa]
- Close valve CB.S1G, CB.S2G, CB.B0G

80 Drywells Setup

The nominal Drywell condition is no water and a dry atmosphere at room temperature. That means that Drywells do not need specific action to reach the required state; it is only needed to make sure that both vessels are dry (without any residual pool water) and at atmospheric temperature.
In dry conditions, the air partial pressure is defined equals at about 131kPa. The desired temperature has been defined at 300K, but it might be different if the room temperature is different.
The Drywells Setup consists actually of making sure that both Drywells are completely dry (phase n° 81) and of pressurizing the vessels up to 131kPa.

81 Drying Vessels

81.0 Monitor Drywell Parameters

	Assumptions:			
-Total Pressure	MP.D1 =	101 [kPa]		
	MP.D2 =	101 [kPa]		
- Local Gas Temperature	MTG.D1.1...6 =	300 [K]	=	27 [°C]
	MTG.D2.1...6 =	300 [K]	=	27 [°C]
- Structure temperature	MTI.D1.1...9 =	300 [K]	=	27 [°C]
	MTI.D2.1...9 =	300 [K]	=	27 [°C]
- Water Level	ML.D1 =	0,0 [m]		
	ML.D2 =	0,0 [m]		

81.1 Make sure both Drywells are completely dry - No pool of water !
- Open both vessels
- Dry residual water pool !
- Close both vessels

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81.2 Connect Drywells to all PCC Condensers
- Open valve CB.P1F, CB.P2F, CB.P3F

81.3 Monitor Drywell Parameters

-Total Pressure	MP.D1 =	101 [kPa]		
	MP.D2 =	101 [kPa]		
- Local Gas Temperature	MTG.D1.1...6 =	300 [K]	=	27 [°C]
	MTG.D2.1...6 =	300 [K]	=	27 [°C]
- Structure temperature	MTI.D1.1...9 =	300 [K]	=	27 [°C]
	MTI.D2.1...9 =	300 [K]	=	27 [°C]

Note: Temperatures in Drywells correspond to room temperature, might be different than indicated !

Check PCCs Parameters

-Total Pressure	MP.P1F =	101 [kPa]		
	MP.P2F =	101 [kPa]		
	MP.P3F =	101 [kPa]		
- Local Gas Temperature	MTG.P1.1...9 =	372 [K]	=	99 [°C]
	MTG.P2.1...9 =	372 [K]	=	99 [°C]
	MTG.P3.1...9 =	372 [K]	=	99 [°C]

82 Pressurization

Both Drywells are now dry and at room temperature; the air partial pressure is equals to the atmospheric pressure. The vessels must be pressurized up to the required pressure (131kPa). Just before the pressurization process by air injection (phase n°82), Drywells are isolated from the PCCs in order to let stabilize the pressure.

92.0 Isolate Drywells from PCCs
- Close valve CB.P1F, CB.P2F, CB.P3F

92.1 Monitor Drywell Parameters

-Total Pressure	MP.D1 =	101 [kPa]		
	MP.D2 =	101 [kPa]		
- Local Gas Temperature	MTG.D1.1...6 =	300 [K]	=	27 [°C]
	MTG.D2.1...6 =	300 [K]	=	27 [°C]
- Structure temperature	MTI.D1.1...9 =	300 [K]	=	27 [°C]
	MTI.D2.1...9 =	300 [K]	=	27 [°C]

92.3 Air injection until Drywell total pressure reaches 131 [kPa] ± 8 [kPa]
Auxiliary air supply system operation
Set up control valve CC.B0G.2 MM.B0G = max
- Open valve CB.D1G, CB.D2G, CB.B0G

Δ (MP.D1) =20 [kPa]
Δ (MP.D2) =20 [kPa]

M(air) = 30 [kg] => time = 1071 [sec]

- Close valve CB.D1G, CB.D2G, CB.B0G

92.4 Monitor Drywell Parameters

- Air Partial Pressure	MPG.D1.1 =	131 [kPa]	±	8 [kPa]
- Local Gas Temperature	MTG.D1.1...6 =	300 [K]	=	27 [°C]
	MTG.D2.1...6 =	300 [K]	=	27 [°C]
- Structure temperature	MTI.D1.1...9 =	300 [K]	=	27 [°C]
	MTI.D2.1...9 =	300 [K]	=	27 [°C]

Note: Temperatures in Drywells correspond to room temperature, might be different than indicated !

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90 RPV Initial Conditions Setup for Test

After having used the RPV as heat source for vessel preconditioning, it might be at conditions different from these required for test initiation; water level, pressure and temperature may need to be adjusted in order to satisfy the test initial conditions. However, the whole preconditioning anticipates the final state; start conditions are defined in order to get RPV conditions after other vessel preconditioning close to the required test initial conditions for the RPV.
Phase n° 91 is a parameter check, which will give the basis for adjusting of RPV conditions.

91 RPV Conditions Adjusting

91.0 Monitor RPV Parameters — Assumtions:

- Total Pressure	MP.RP.1 =	262 [kPa]		
- Local Fluid Temperature	MTF.RP.1...5 =	399 [K]	=	126 [°C]
- Water Level	ML.RP.1 =	12,3 [m]		

91.1 Adjust Test Initial Conditions in RPV

Assuming saturated conditions and a negligible air partial pressure, the pressure is set by adjusting the temperature. Cooling is achieved by supplying cold water and/or by venting steam to the atmosphere. Heating is performed by using RPV heaters. Any required action is allowed to set up the RPV test initial conditions to match the required tolerances (ref. GE document "Test Plan Specification").

91.2 Vent Gas to the Atmosphere
- Open valve CC.RPV — MP.RP.1 = 131 [kPa]

91.3 Supply water until water reaches level equal to 12,7 [m]
Auxiliary water system operation
Pump MP.B0D On — MV.B0D = 2,0 [l/s]
ML.RP.1 = 12,7 [m]
Pump MP.B0D Off

91.4 Set RPV Parameters

- Total Pressure	MP.RP.1 =	131 [kPa]		
- Mean Fluid Temperature	MTF.RP.1...5 =	380 [K]	=	107 [°C]
- Water Level	ML.RP.1 =	12,7 [m]		

100 Test Conditions Setup

PANDA preconditioning has been now performed and the state of the facility is close to that required for test initiation; conditions out of tolerance must be adjusted to the defined values.
The test condition setup starts with the adjustment of both Suppression Chamber (SC) Pools (phase n° 101) and continues with the SCs gas space setup (phase n°102). The GDCS tank is then adjusted to its defined test initial conditions (phase n°103), before adjusting conditions of both Drywells (phase n° 104). The test condition setup continues then with the PCC Pools condition adjustment (phase n° 105, 106 & 107), which can be performed simultaneously. All these phases are not defined in detail, allowing any required action to get the test initial conditions established.

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101 Adjusting SC Pools Conditions

101.0 Adjust Test Initial Conditions in Suppression Chamber Pools

After the check of the water temperature and water level, actions to adjust the corresponding parameters are supplying or draining water in order to satisfy the defined water level, and water circulation through one or the other of the two auxiliary heat exchangers as required to establish the desired temperature. Any action is allowed to setup the SCs pools test initial conditions according to the defined tolerances (ref. GE document "Test Plan Specification").

101.1 Monitor SCs Parameters

- Mean Water Temperature
- Local Water Temperature
- Water Level

$T_{w\_mean}(S1)$ =	352 [K]	±	2 [K]
=	79 [°C]		
$T_{w\_mean}(S2)$ =	352 [K]	±	2 [K]
=	79 [°C]		
MTL.S1.1...6 =	$T_{w\_mean}(S1)$	±	2 [K]
MTL.S2.1...6 =	$T_{w\_mean}(S2)$	±	2 [K]
ML.S1 =	3,8 [m]	±	0,10 [m]
ML.S2 =	3,8 [m]	±	0,10 [m]

Record on attached checklist

102 Adjusting SC Gas Space Conditions

102.0 Adjust Test Initial Conditions in Suppression Chamber Gas Space

Assuming saturated steam/air mixture, the temperature and the pressure are separately adjusted by steam and air injection. Any action is allowed to setup the SCs gas space test initial conditions according to the defined tolerances (ref. GE document "Test Plan Specification").

102.1 Monitor SCs Parameters

-Total Pressure
- Mean Gas Temperature
- Local Gas Temperature

MP.S1 =	131 [kPa]	±	4 [kPa]
MP.S2 =	131 [kPa]	±	4 [kPa]
$T_{G\_mean}(S1)$ =	352 [K]	±	2 [K]
=	79 [°C]		
$T_{G\_mean}(S2)$ =	352 [K]	±	2 [K]
=	79 [°C]		
MTG.S1.1...6 =	$T_{G\_mean}(S1)$	±	2 [K]
MTG.S2.1...6 =	$T_{G\_mean}(S2$	±	2 [K]

Record on attached checklist

103 Adjusting GDCS Conditions

103.0 Adjust Test Initial Conditions in GDCS

Assuming saturated steam/air mixture, the temperature and the pressure are separately adjusted by steam and air injection. Any required action is allowed to setup the GDCS test initial conditions according to the defined tolerances (ref. GE document "Test Plan Specification").

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103.1 Set GDCS Parameters
- -Total Pressure
- Mean Fluid Temperature
- Local Fluid Temperature
- Water Level

MP.GD =	131 [kPa]	±	4 [kPa]
T_{F_mean}(GD) =	333 [K]	±	2 [K]
=	60 [°C]		
MTF.GD.1...7 =	T_{F_mean}(GD)	±	2 [K]
ML.GD =	0,1 [m]	±	0,10 [m]

Record on attached checklist

104 Adjusting DW Conditions

104.0 Adjust Test Initial Conditions in Drywells

Considering pure air condition at atmosphic pressure and at room temperature, the Drywell do not need any temperature adjustment. In order to establish the required air partial pressure, it might be needed to adjust the pressure by injecting air to the Drywells. Test initial conditions and corresponding tolerances are defined in the GE document "Test Plan Specification".

104.1 Set Drywells Parameters
- Air Partial Pressure
- Mean Gas Temperature
- Local Gas Temperature
- Structure temperature
- Water Level

MPG.D1.1 =	131 [kPa]	±	8 [kPa]
MPG.D2.1 =	131 [kPa]	±	8 [kPa]
* T_{G_mean}(D1) =	300 [K]		
=	27 [°C]		
* T_{G_mean}(D2) =	300 [K]		
=	27 [°C]		
MTG.D1.1...6 =	T_{G_mean}(D1)	±	2 [K]
MTG.D2.1...6 =	T_{G_mean}(D2)	±	2 [K]
MTI.D1.1...9 =	T_{G_mean}(D1)	±	2 [K]
MTI.D2.1...9 =	T_{G_mean}(D2)	±	2 [K]
ML.D1 =	0,0 [m]	±	0,10 [m]
ML.D2 =	0,0 [m]	±	0,10 [m]

Record on attached checklist

105 Adjusting PCC1 Pool Conditions

105.0 Adjust Test Initial Conditions in PCC1 Pool

Assuming saturated conditions at atmospheric pressure, the water temperature might be adjusted by water circulation through auxiliary heat exchanger; due to evaporation, the water level might need adjustment by supplying water. Any action is allowed to setup the PCC pools test initial conditions according to the defined tolerances (ref. GE document "Test Plan Specification").
All PCC pools conditions must be adjusted; that may be perfomed simultaneously by

105.1 Set PCC1 Pool Parameters
- Mean Water Temperature
- Local Water Temperature
- Water Level

T_{W_mean}(U1) =	372 [K]	+0/ -4	[K]
=	99 [°C]		
MTL.U1.1...7 =	T_{W_mean}(U1)	±	2 [K]
ML.U1 =	4,6 [m]	±	0,20 [m]

Record on attached checklist

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106 Adjusting PCC2 Pool Conditions

106.0 Adjust Test Initial Conditions in PCC2 Pool

For PCC2 pool conditions adjustment refer to description of pool conditions adjustment in phase n°101.

106.1 Set PCC2 Pool Parameters

- Mean Water Temperature
- Local Water Temperature
- Water Level

$T_{W\_mean}(U2)$ =	372 [K]	±	4 [K]
=	99 [°C]		
MTL_U2.1...7 =	$T_{W\_mean}(U2)$	±	2 [K]
ML_U2 =	4,6 [m]	±	0,20 [m]

Record on attached checklist

107 Adjusting PCC3 Pool Conditions

107.0 Adjust Test Initial Conditions in PCC3 Pool

For PCC3 pool conditions adjustment refer to description of pool conditions adjustment in phase n°101.

107.1 Set PCC3 Pool Parameters

- Mean Water Temperature
- Local Water Temperature
- Water Level

$T_{W\_mean}(U3)$ =	372 [K]	±	4 [K]
=	99 [°C]		
MTL_U3.1...19 =	$T_{W\_mean}(U3)$	±	2 [K]
ML_U3 =	4,6 [m]	±	0,20 [m]

Record on attached checklist

110 Test

The facility satisfies now the required test initial conditions and must be configured according to the test configuration described in GE document "Test Plan Specification". Due to the relatively quick test initiation, data recording is started (phase n°111) before setting the desired RPV conditions (phase n°112) and before setting the test configuration (phase n°113). That last phase should not affect the PANDA conditions, but in order to assure that the facility stays inside the defined tolerances, the duration of all these phases between the test configuration setup (phase n°113.1 to n° 133.9) and the test initiation (phase n°113.10) should not exceed a few minutes (~5min). After test initiation, the test initial conditions must be within the tolerances given in phases n°110 and 112, in order to satisfy the acceptance criteria defined in the "Test Plan Specification". If test initial conditions do not satisfy the above mentioned acceptance criteria, the test is interrupted, the heat power is shut down (phase n° 122.0), the vessels are isolated (phase n° 122.1) and the procedure starts again with the Test Conditions Setup (phase n° 100).
Due to the excessive pressure differences between vessels during the preconditioning, the pressure difference transmitters lineup (valve in) must be performed after the facility has test initial conditions established; it is performed during test configuration setup (phase n°113.7).

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111 Data Recording

111.0 Start Data Recording (At least 5 hours after test initiation)

- Set "Daten-Speich." on HP-1000
- Set "Data recording rate" on HP-1000 (cf. requirement in "Test Plan Specification")
  Sampling Rate = 0.5 Hz

Record on attached checklist

111.1 Record the PANDA-Building temperatures at elevation 0m and 22m

Record on attached checklist

112 RPV Conditions Adjusting

112.0 Adjust Test Initial Conditions in RPV

Assuming saturated conditions and a negligible air partial pressure, the required pressure is set by adjusting the temperature. Any required action is allowed to setup the RPV test initial conditions according to the defined tolerances (ref. GE document "Test Plan Specification").

112.1 Set RPV Parameters

- Total Pressure	MP.RP.1 =	131 [kPa]	±	4 [kPa]
- Mean Fluid Temperature	$T_{F,mean}$(RP) =	380 [K]	±	2 [K]
	=	107 [°C]		
- Local Fluid Temperature	MTF.RP.1..5 =	$T_{F,mean}$(RP)	±	2 [K]
- Water Level	ML.PP.1 =	12,7 [m]	±	0,20 [m]

Record on attached checklist

113 Configuration Setup and Test Initiation

113.0 Setup Constant Heat Power - Leave it OFF

- Heat Power OFF - Set Heat Power equals to 1,13 MW

Record on attached checklist

113.1 Make sure all PCC Pools together are isolated

- Close valve CB.B1L, CB.U0L
- Open valve CB.U1L, CB.U2L, CB.U3L

Record on attached checklist

113.2 Open GDCS Pressure Equialization lines

- Open valve CB.GP1, CB.GP2

Record on attached checklist

113.3 Open Main Vent Lines

- Open valve CB.MV1, CB.MV2

Record on attached checklist

113.4 Open GDCS Return Line

- Open valve CB.GRT.2, CB.GRT.1

Record on attached checklist

113.5 Open PCC Vent Lines

- Open valve CB.P1V, CB.P2V, CB.P3V

Record on attached checklist

113.6 Open PCC Condensate Lines

- Open valve CB.P1C, CB.P2C, CB.P3C

Record on attached checklist

113.7 Open PCC Feed Lines

- Open valve CB.P1F, CB.P2F, CB.P3F

Record on attached checklist

113.8 Instrument / Zero Check and Pressure Difference Transmitters Piping Valve in

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- Check instruments as described in phase n°16
- Pressure Difference Transmitters Piping Valve In — Record on attached checklist

113.9 Open Main Steam Lines
- Open valve CB.MS1, CB.MS2
- Open valve CC.MS1, CC.MS2 — Record on attached checklist

113.10 Print Valve Status Report every two hours during the Test duration
- Compare Valve Status to "Valve Status for Test Start M7"
- Attach Valve Status Report to the Checklist

Record on attached checklist

113.11 Check Oxygen for O_2 Probes
- Check oxygen flow which must be at ~10-20% every two hours

Record on attached checklist

113.12 Test Initiation
- Set Heat Power ON - constant power equals to 1.13 MW

Record on attached checklist

113.13 Check Test Initial Conditions - Acceptance Criteria
- Check parameters as indicated in phases 100 & 112.

Record on attached checklist

113.14 Test Interruption
If the Acceptance Criteria are not satisfied go to phase n° : 122.0 & 122.1
=> phase n° 122.0
=> phase n° 122.1
- Restart procedure with phase n° 100 (Test Conditions Setup)

113.15 VB-Opening Setup
- Set up automatic VB-Opening Control (Process Control System)
- Set up automatic Burst-measurement for VB-Opening (DAS-System)

Record on attached checklist

120 End of Test

At the end of 5 hours data recording the test will be terminated. Phases n° 121 and 122 describe the end of test and the facility shut down.

121 End of Data Recording

121.0 Stop Data Recording (cf DAS User's Guide)
After 5 hours data recording teh test is terminated.

121.1 Save Data (cf Control System User's Guide) — Record on attached checklist

121.2 Record the PANDA-Building temperatures at elevation 0m and 22m

Record on attached checklist

122 Facility Shut Down

122.0 Stop RPV Heat Power
Heater Off

122.1 Oxygen Probes Shut Off

122.2 Difference Pressure Transmitters Piping Valve Out

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122.3 Isolating Vessels

- Close valve CB.MS1, CB.M2S
  CB.P1C, CB.P2C, CB.P3C
  CB.P1V, CB.P2V, CB.P3V
  CB.GRT.2, CB.GRT.1
  CB.MV1, CB.MV2
  CB.P1F, CB.P2F, CB.P3F
  CB.GP1, CB.GP2

122.4 Valve Alignment

- Set valve positions according to the valve STARTUP status
- Printout valve status report
- Compare to valve status for facility shut down

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200 Checklist

Checklist Transient Test Number		
Completion of Procedure Phase n°	Date / Time	Signatures Performer / Reviewer
11		
12		
13		
15		
101		
102		
103		
104		
105		
106		
107		
111.0		
111.1	Building Temperature at 0m: and 22m:	
112		
113.0		
113.1		
113.2		
113.3		
113.4		
113.5		
113.6		
113.7		
113.8		
113.9		
113.10		
113.12	Start Time:	
113.13		
113.15		
121.1		
121.2	Building Temperature at 0m: and 22m:	