Appendix A.2 Oconee Thermal-Hydraulic Results

This appendix presents an overview of the RELAP5 modeling details and the results of the 177 cases evaluated for the Oconee plant. For Palisades, 83 cases in the LOCA category, 79 cases in the reactor/turbine trip category and 10 cases in the MSLB category and 5 in the SGTR category were evaluated.

The RELAP5 model of the Oconee plant was developed, starting from the base model used in the code scaling, applicability and uncertainty (CSAU) study as discussed in Section 5.2. The original model was modified as appropriate for performing PTS analyses and updated to reflect the current Oconee plant configuration and operating procedures. The model modifications are described in Reference A.2-1. Nodalization diagrams of the reactor vessel, coolant loops and main steam system regions of the Oconee PTS RELAP5 model are provided in Figures A.2-1 to A.2-5, respectively.

Results for each of the 177 cases analyzed are presented below as Figures A.2-6 through A.2-182. For each case, the following information is given in tabular format:

Case Category	LOCA, RT/TT, MSLB, etc.
Primary Failures	Description of the primary side failure
Secondary Failures	Description of the secondary side failure
Operator Actions	Description of any operator actions
Min DC Temp	The minimum average downcomer fluid temperature and associated time that minimum occurred
Comments	Any comments specific to the event

In addition to the information described above, plots of average downcomer fluid temperature, primary system pressure, and downcomer wall heat transfer coefficient are presented. Any analytical assumptions used in each case are also presented. To facilitate comparisons among cases, each figure presents summary information for the minimum downcomer average temperature in the reactor vessel and the time during the event sequence when that minimum is reached. The results shown in these figures are used in the FAVOR probabilistic fracture mechanics analysis.

In Oconee, emergency operating instructions direct the operators to trip the reactor coolant pumps only after RCS fluid subcooling is lost. For the Oconee analyses, it was assumed that the operator would trip the pumps when the RCS subcooling falls below 0.27 K (0.5^{o}F). Unless otherwise noted, the operators are always assumed to immediately trip the reactor coolant pumps according to these criteria. Other operator actions assumed for a particular transient are listed under operator actions in each figure. For some cases, operator throttling of the HPI flow is assumed based on satisfaction of pressurizer level and RCS subcooling criteria.

Unless otherwise indicated in the modeling notes included with each figure, cases are assumed to be initiated from hot full power (HFP) conditions. For Oconee, the reactor

thermal power corresponding to HFP conditions is 2568 MWth. When a hot zero power (HZP) case is indicated, the event is assumed to be initiated using the reduced decay heat assumption discussed in Section 5.2.

Many of the LOCA analyses were performed using large reverse flow loss coefficients in the pump-suction cold leg regions of the RELAP5 model as indicated in the modeling notes included with each figure. These coefficients are used to preclude setting up non-physical flow recirculation between the two common cold legs on each coolant loop. Some of the analyses were performed without this assumption to judge its effect on the results and these are identified as such in the modeling notes.

All MSLB cases are assumed to be initiated by the double-ended rupture of the steam line connected to one SG. The rupture is assumed to be downstream of the flow restrictor and inside the containment. Steam line breaks outside containment are not of PTS concern for Palisades because the early and automatic closure of the main steam isolation valves effectively terminates the transient event.

Certain unique features of the Oconee plant affecting its thermal-hydraulic response pertinent for PTS are described as follows.

A unique feature of the B&W system compared to the Palisades and Beaver Valley systems is the use of reactor vessel vent valves in the core barrel. The vent valves connect the upper plenum to the vessel annulus above the hot and cold leg nozzles. Each valve consists of a hinged disk and valve body that remains closed during normal operation. The valves open if the pressure drop across the core barrel reverses, a situation that can exist when natural circulation and/or flow stagnation occurs. The vent valves allow steam flow from the upper plenum of the reactor vessel through the downcomer to the break in the event of a cold leg break. The vent valves allow hot water to flow into the downcomer region during PTS transients when natural circulation flow may be limited. Flow from the vent valves will enhance mixing of the HPI flow in the downcomer.

The once-through steam generator (OTSG) is another unique feature of the B&W system. The OTSG is a vertical straight tube and shell design with flat tubesheets and hemispherical heads on either end. The OTSG is designed to produce dry, superheated steam at constant turbine throttle pressure throughout the plant power range. The OTSG is also designed to provide decay heat removal in the event of a reactor trip. Because of the way a OTSG operates, the water mass is much lower during full power operation relative to the U-tube design. A key aspect of hot zero power operation from the perspective of thermal hydraulic conditions is the change in the mass of water in the steam generator between HFP and HZP operation. For Oconee, the mass of water is about 18180 kg (40,000 lbm) during HFP operation and about 5000 kg (11,000 lbm) during HZP operation. In contrast, the mass of water in the Palisades steam generator is about 64,545 kg (142,000 lbm) at full power and 82,670 kg (210,000 lbm) at hot zero power. As a result, flashing of water to steam will have less impact in the OTSG design.

Post reactor trip feedwater control at Oconee depends upon the status of the reactor coolant pumps. If one or more of the reactor coolant pumps are running, the level is maintained at 76 cm (30 in) above the lower tube sheet. This level provides an

adequate heat transfer area for decay heat removal. If there is a total loss of reactor coolant flow (all reactor coolant pumps trip), then decay heat is removed by natural circulation. The level is then maintained at 610 cm (240 in) above the lower tube sheet to provide a larger heat transfer surface for decay heat removal. Also, the feedwater flow injection point changes from the steam generator downcomer to the emergency feedwater header, which is located near the top of each steam generator. Steam generator level control is of interest in a PTS evaluation since the possibility exists that a control system failure could cause overfilling of the steam generator resulting in overcooling of the reactor system.

The borated water storage tank (BWST) is the initial source of water for the HPI system and the LPI system. This tanks also supplies water to the containment spray system. The available volume is 1240 m^3 (327,000 gal). Although flow through all of these systems depletes the BWST inventory, the containment spray system dominates the depletion process. As the BWST empties, HPI and LPI suction switches to the to the containment sump where water has collected from the break discharge. This switchover significantly affects the PTS response of the plant because the injection temperature is increased from the BWST temperature to the containment sump temperature. In the RELAP5 calculations reported here, the BWST level is tracked using a control variable which integrates the flows through the systems that drain the tank. When the integrated flow indicates that the low BWST level has been reached, ECCS suction switchover to the containment sump occurs. In the RELAP5 analysis, the ECC suction temperature ranges from 314 K (105°F) to 322 K (120°F) based on a 0.00465 m^2 (0.05 ft^2) break and the time switchover is determined to occur.

The Oconee plant utilizes the Main Steam Line Break (MSLB) Detection and Feedwater Isolation circuitry to mitigate containment overpressurization by isolating feedwater to both steam generators during a main steam line break event. This circuitry is designed to trip the main feedwater pumps, to inhibit/stop the turbine-driven emergency feedwater pump, and to isolate main feedwater and startup feedwater systems. The MSLB circuitry was added in response to I&E bulletin 80-04 to prevent overfeed and rapid reactor cooldown and return to power.

Detailed information regarding the modeling assumptions and calculated plant responses for each of the Oconee cases is found in Reference A.2-1.

References

A.2-1 Beaton, R. and Arcieri, W., RELAP5 Model Development for Oconee PTS Applications, (in preparation).

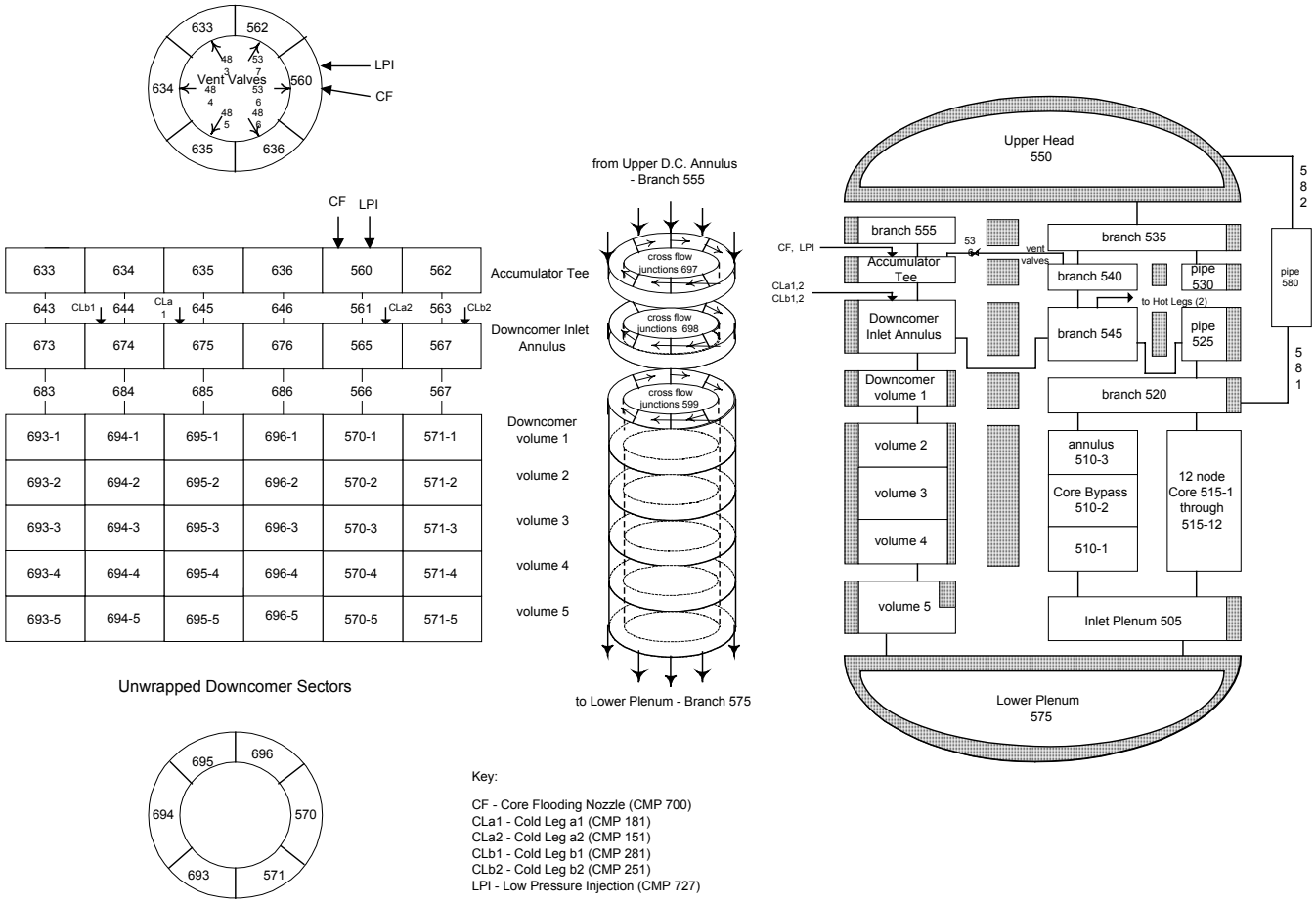


Figure A.2-1: Reactor Vessel RELAP5 Nodalization

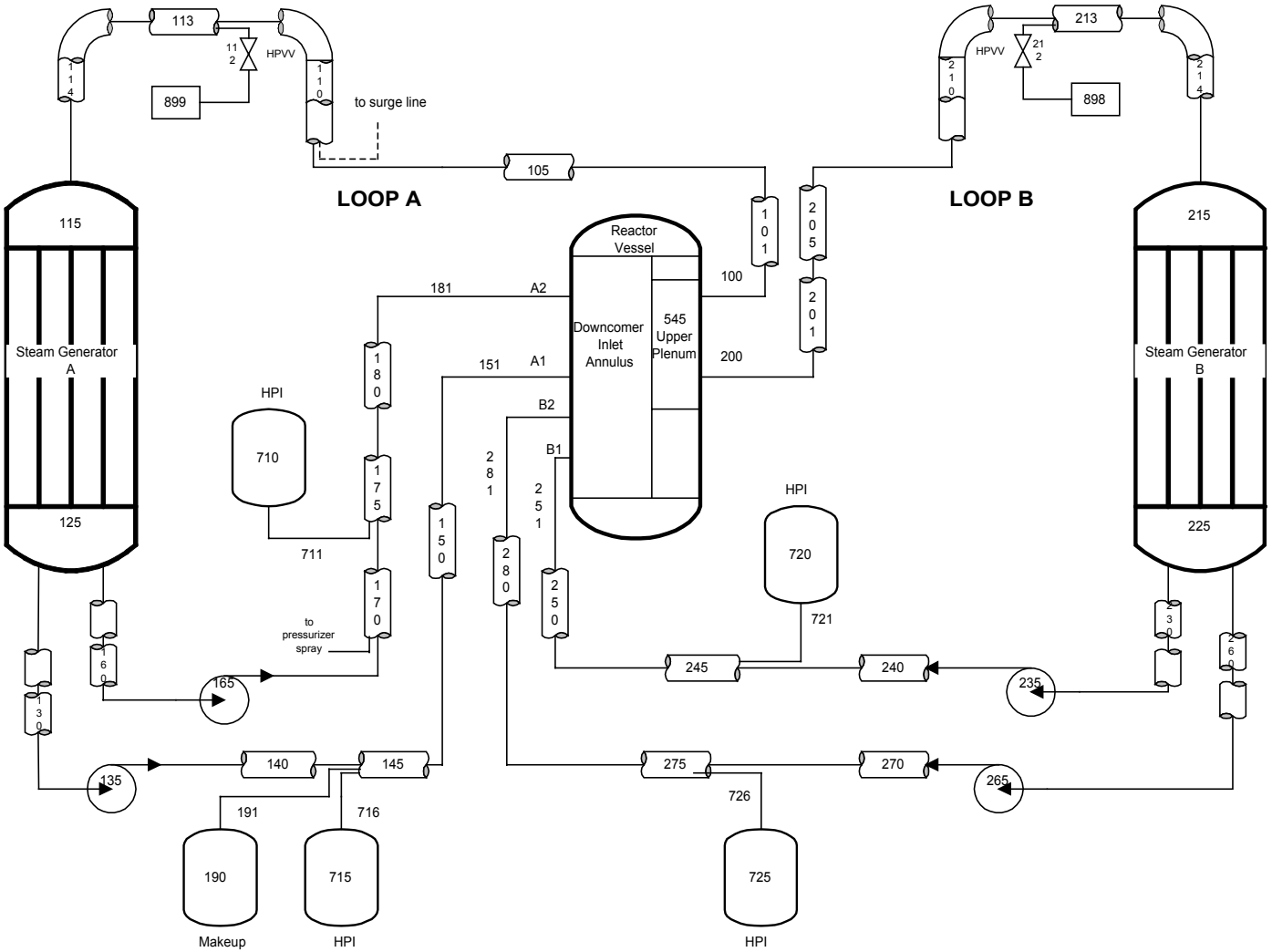


Figure A.2-2: Reactor Coolant System RELAP5 Nodalization

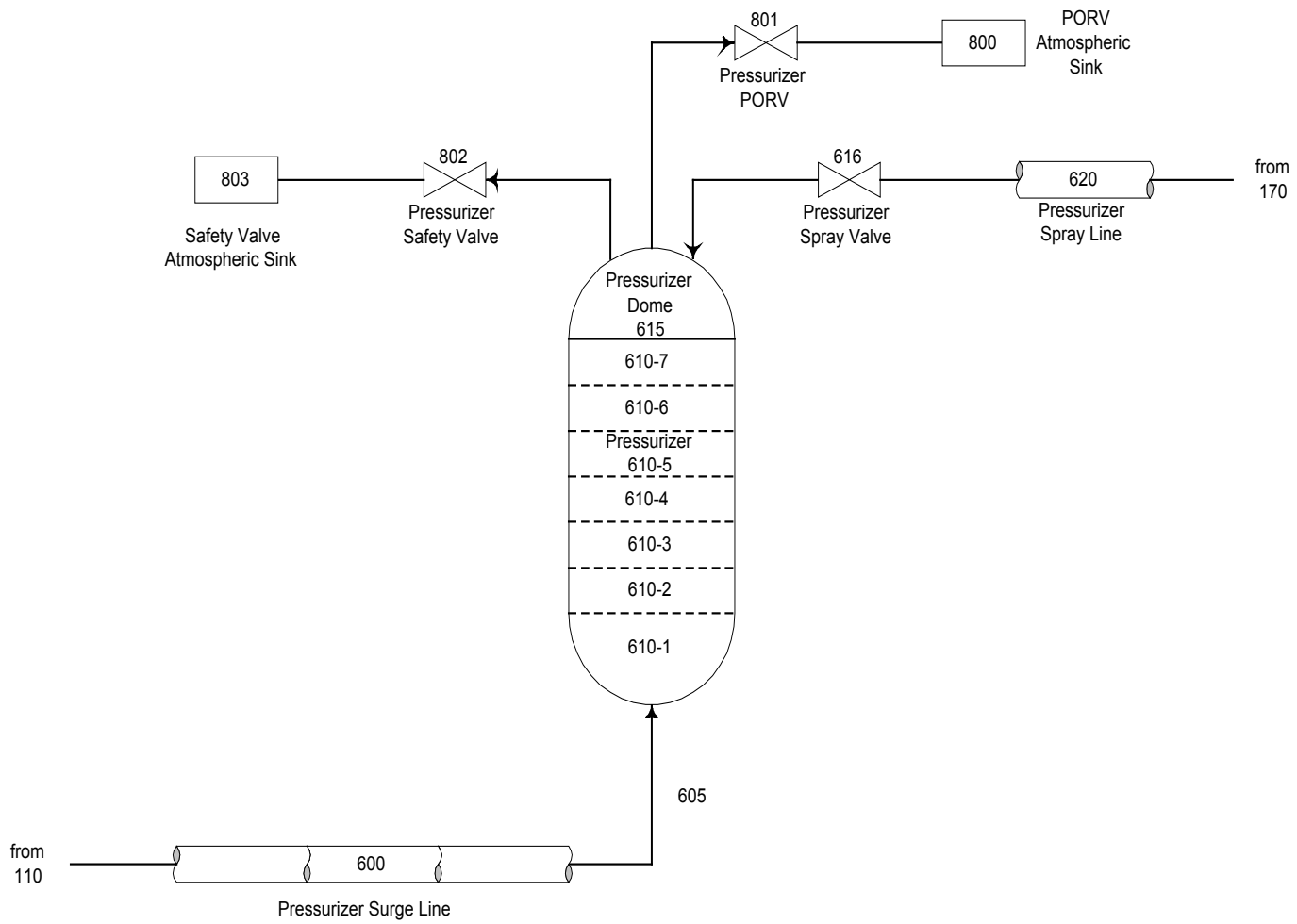


Figure A.2-3: Pressurizer System Nodalization

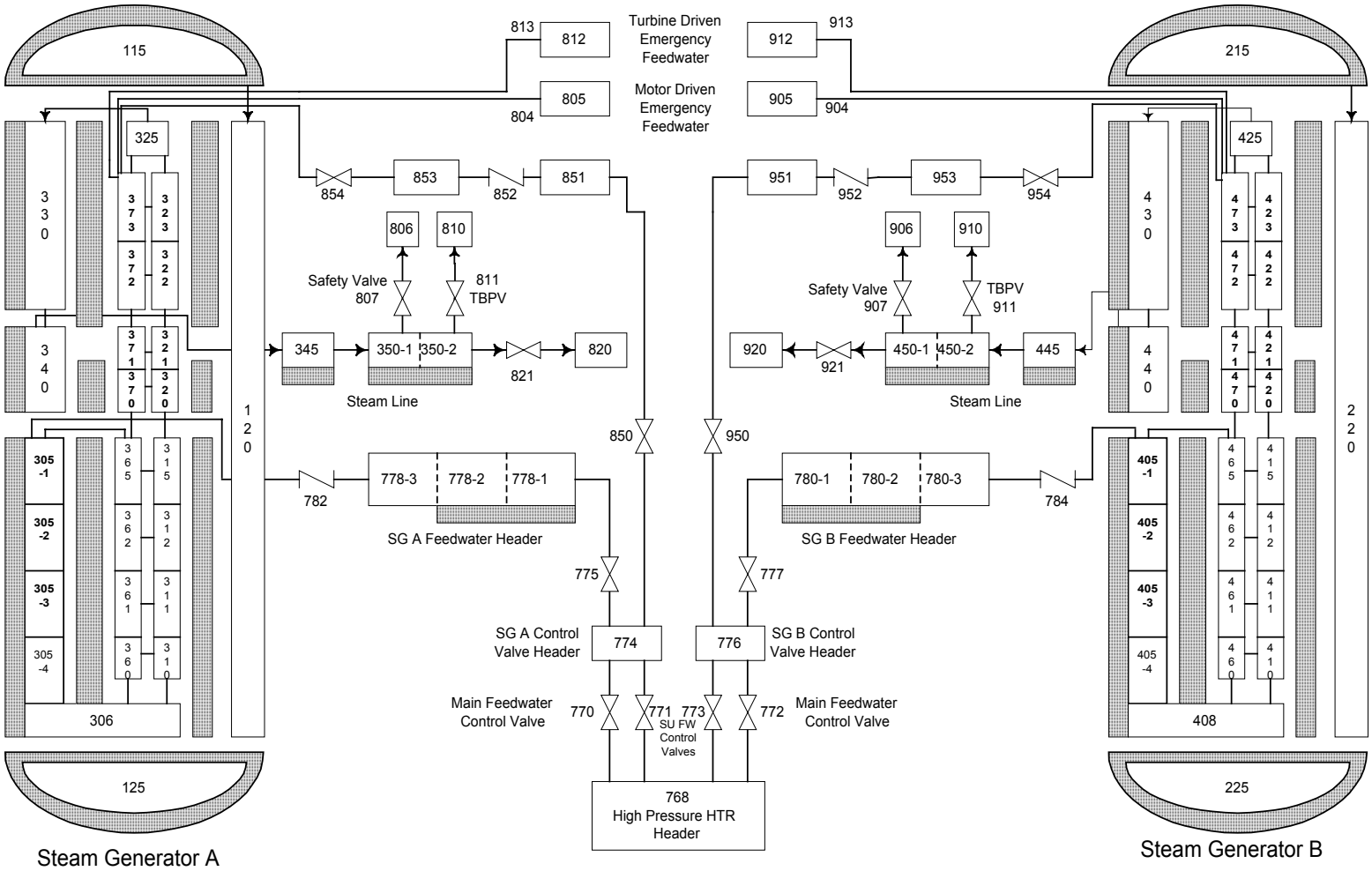


Figure A.2-4: Steam Generator Secondary Side Nodalization

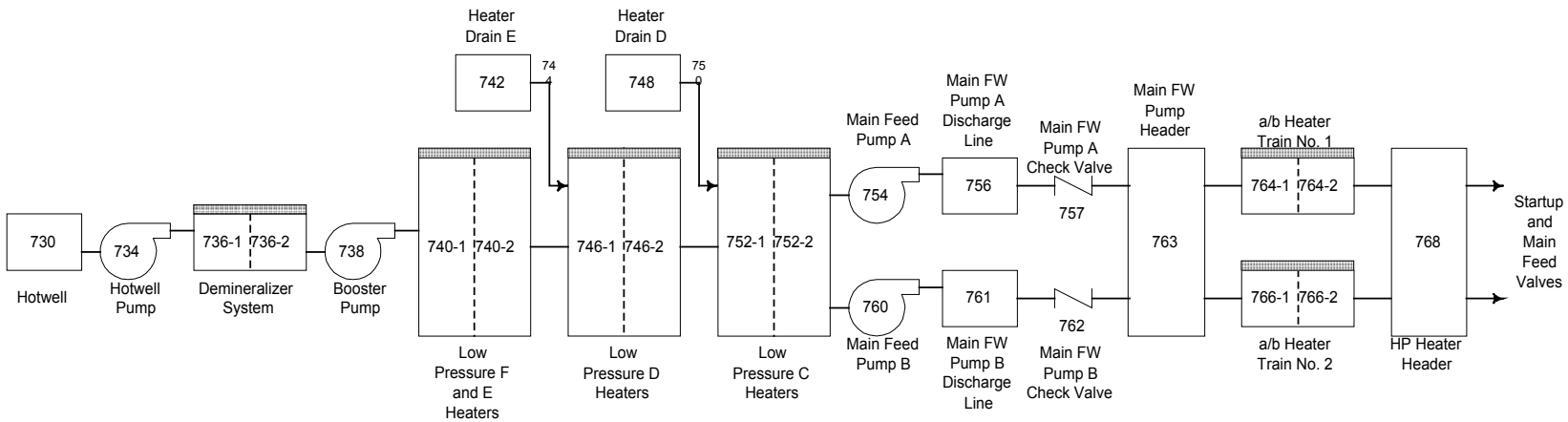


Figure A.2-5: Main Feedwater Train RELAP5 Nodalization (from Hotwell to Startup and Main Feedwater Valves)

Case Category	LOCA
Primary Failures	2.54 cm (1 inch) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	548.1 K (527.0°F) at 9990 s
Comments	None.

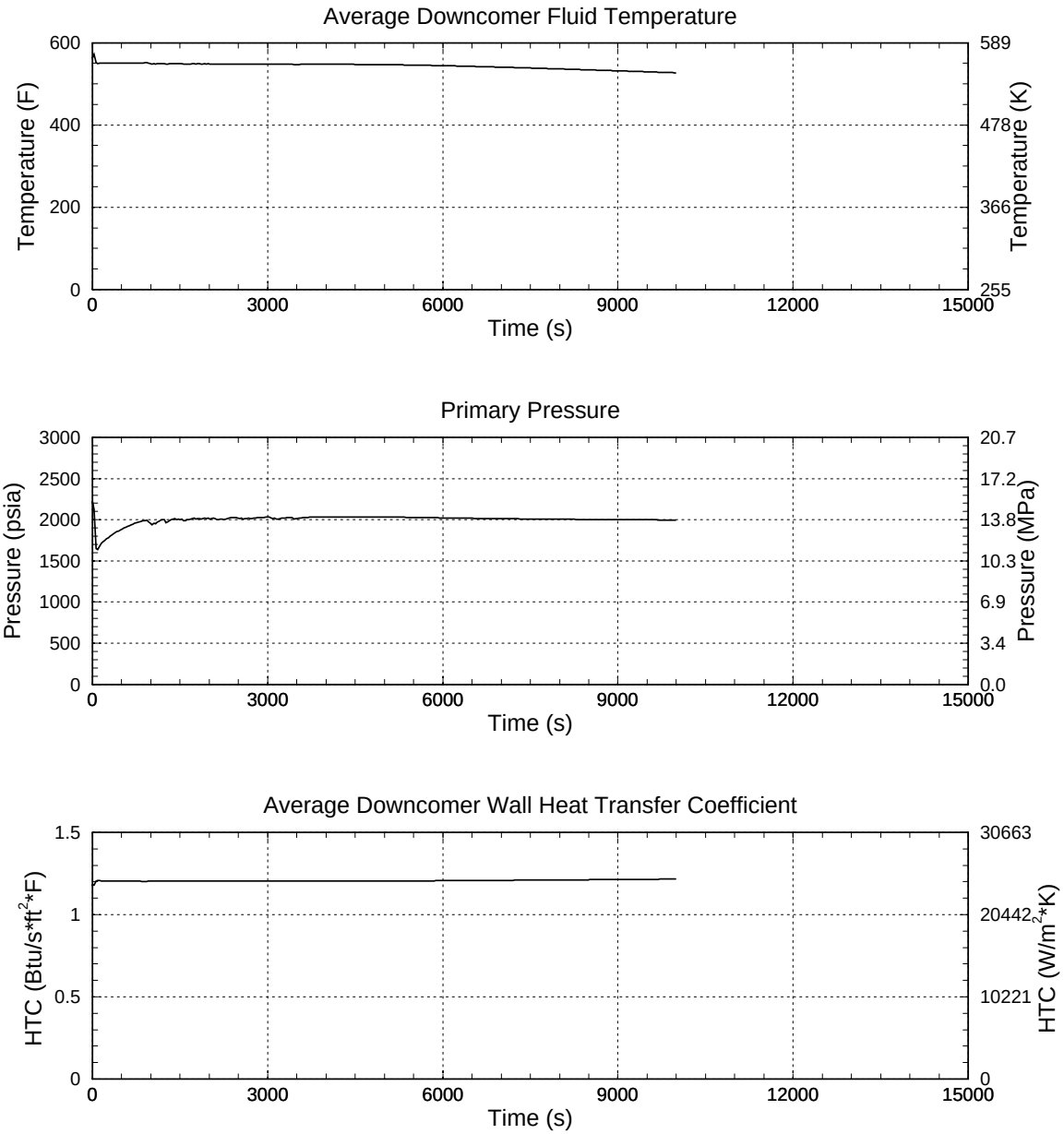


Figure A.2-6: Oconee PTS Results for Case 001

Case Category	LOCA
Primary Failures	3.59 cm (1.414 in) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	498.8 K (438.1°F) at 9990 s
Comments	None.

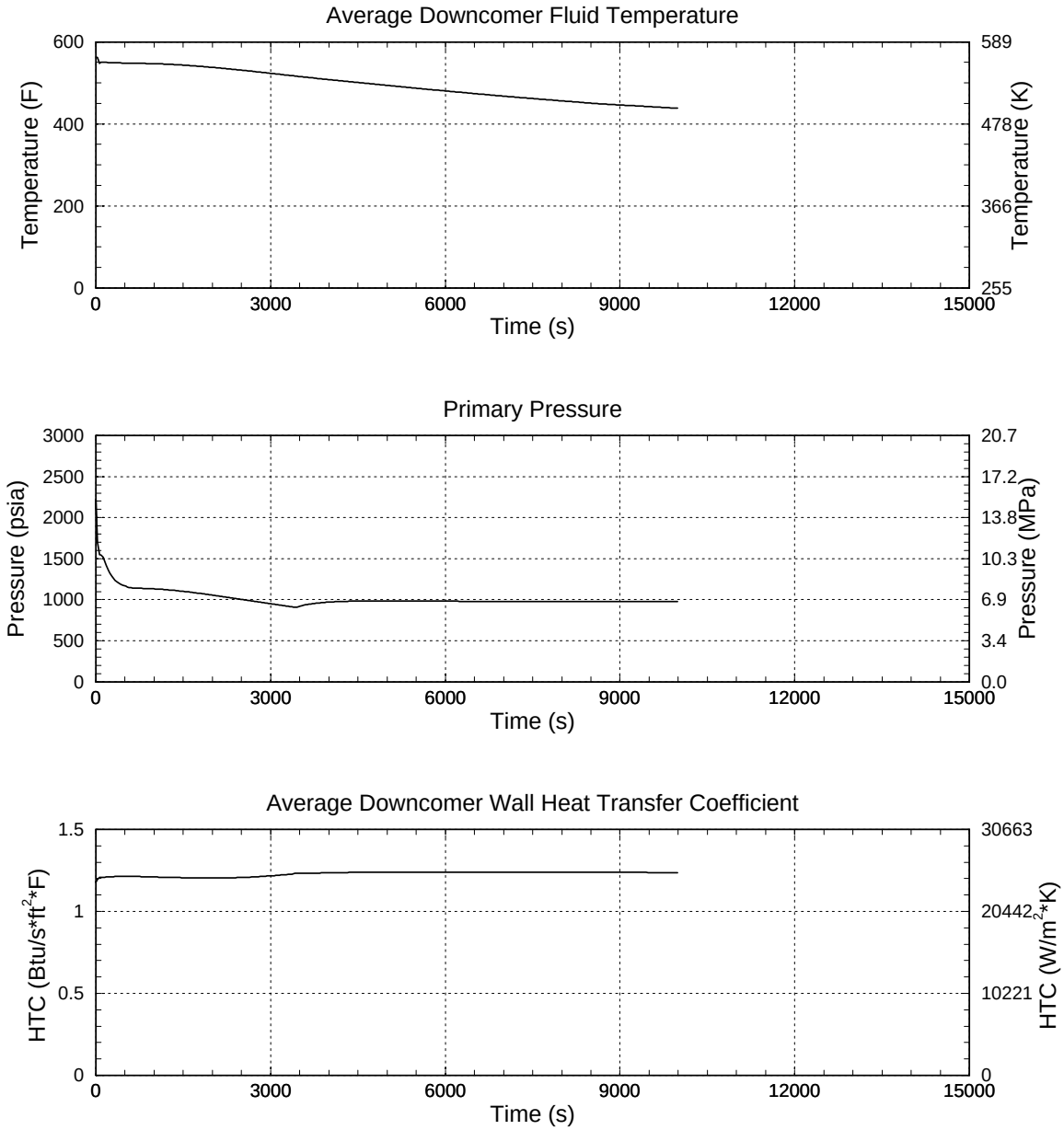


Figure A.2-7: Oconee PTS Results for Case 002

Case Category	LOCA
Primary Failures	5.08 cm (2 in) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	309.5 K (97.4°F) at 15000 s
Comments	None.

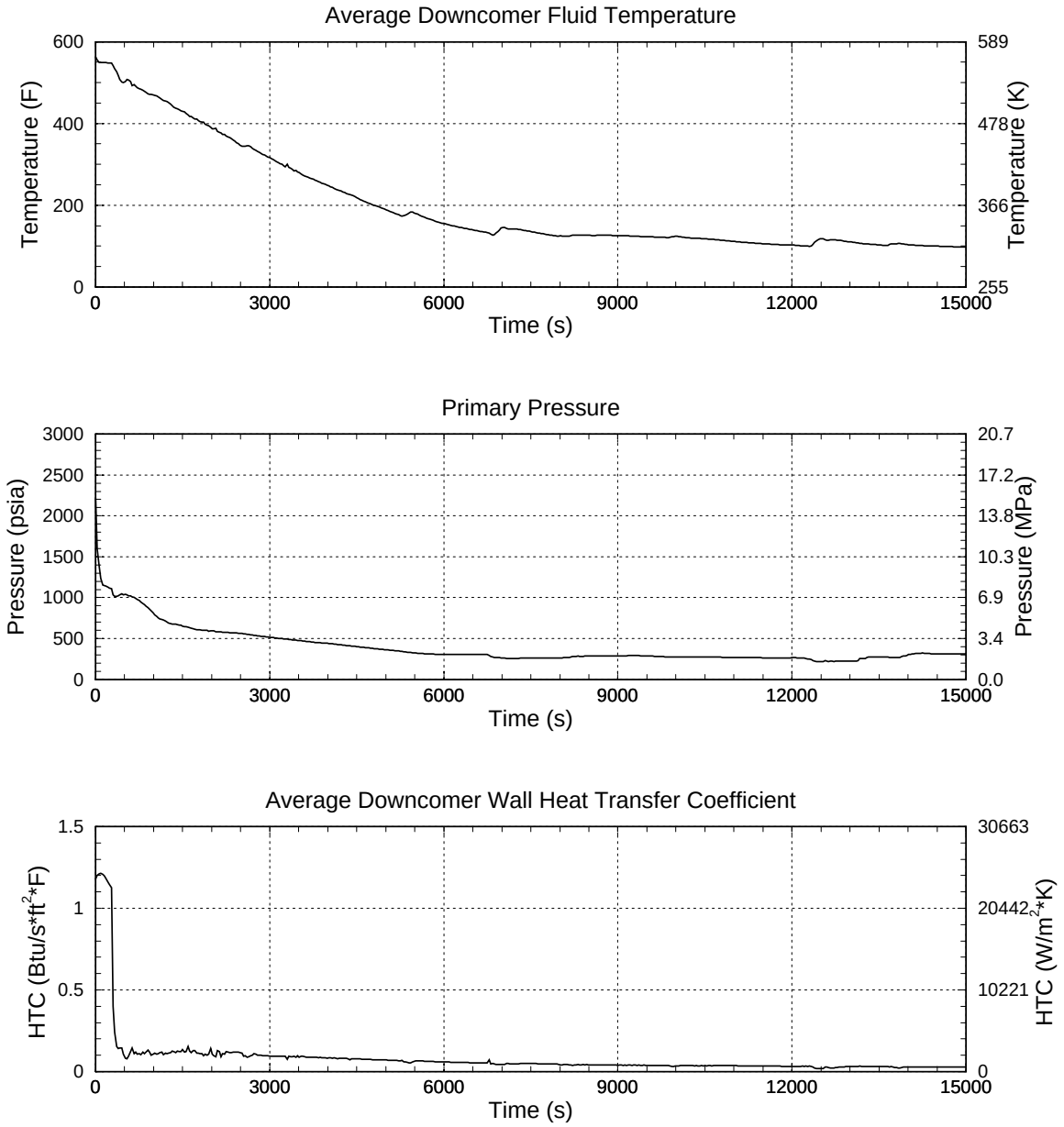


Figure A.2-8: Oconee PTS Results for Case 003

Case Category	LOCA
Primary Failures	7.183 cm (2.828 in) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	296.3 K (73.7°F) at 15000 s
Comments	None.

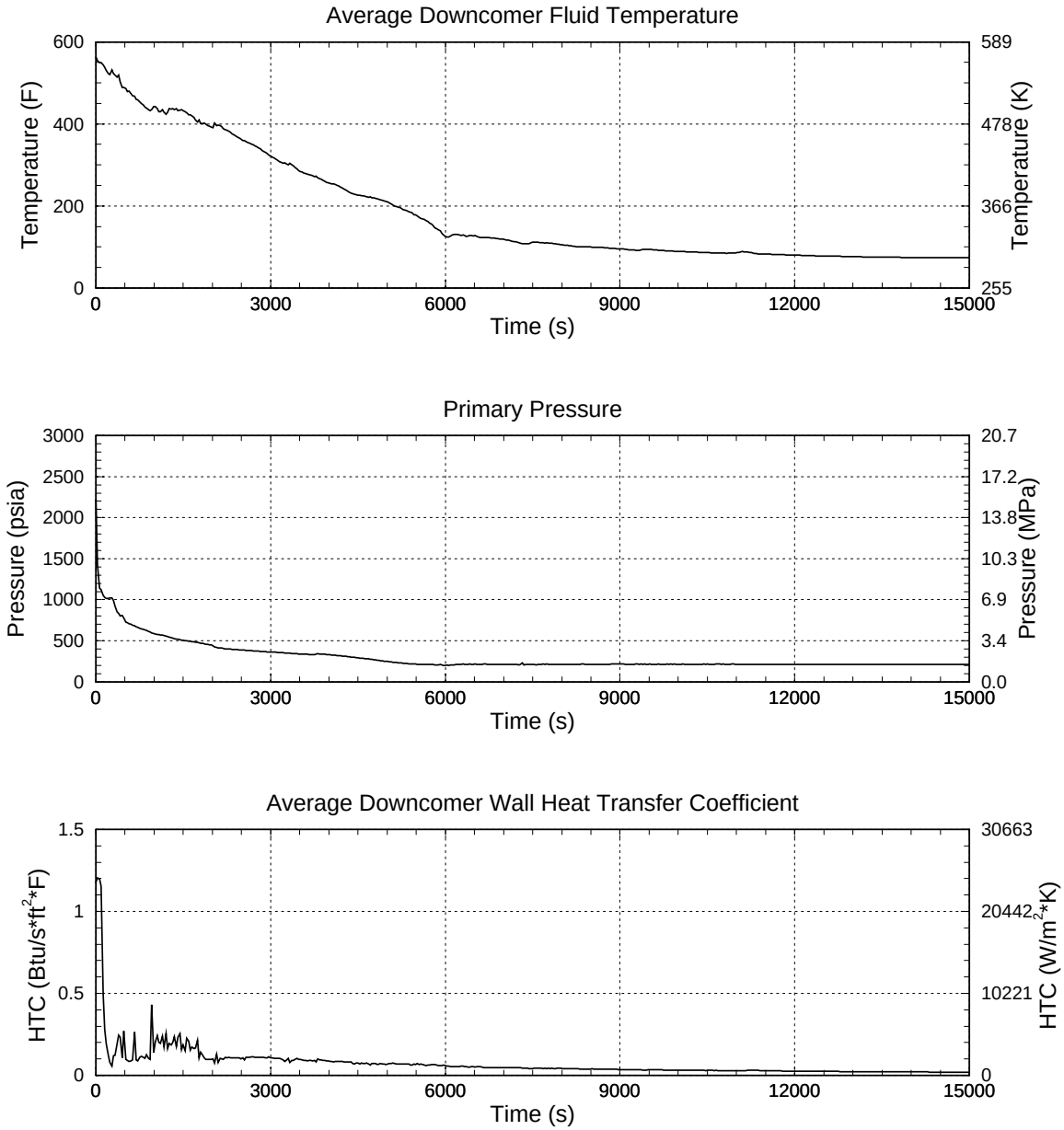


Figure A.2-9: Oconee PTS Results for Case 004

Case Category	LOCA
Primary Failures	10.16 cm (4 inch) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	294.6 K (70.7°F) at 15000 s
Comments	None.

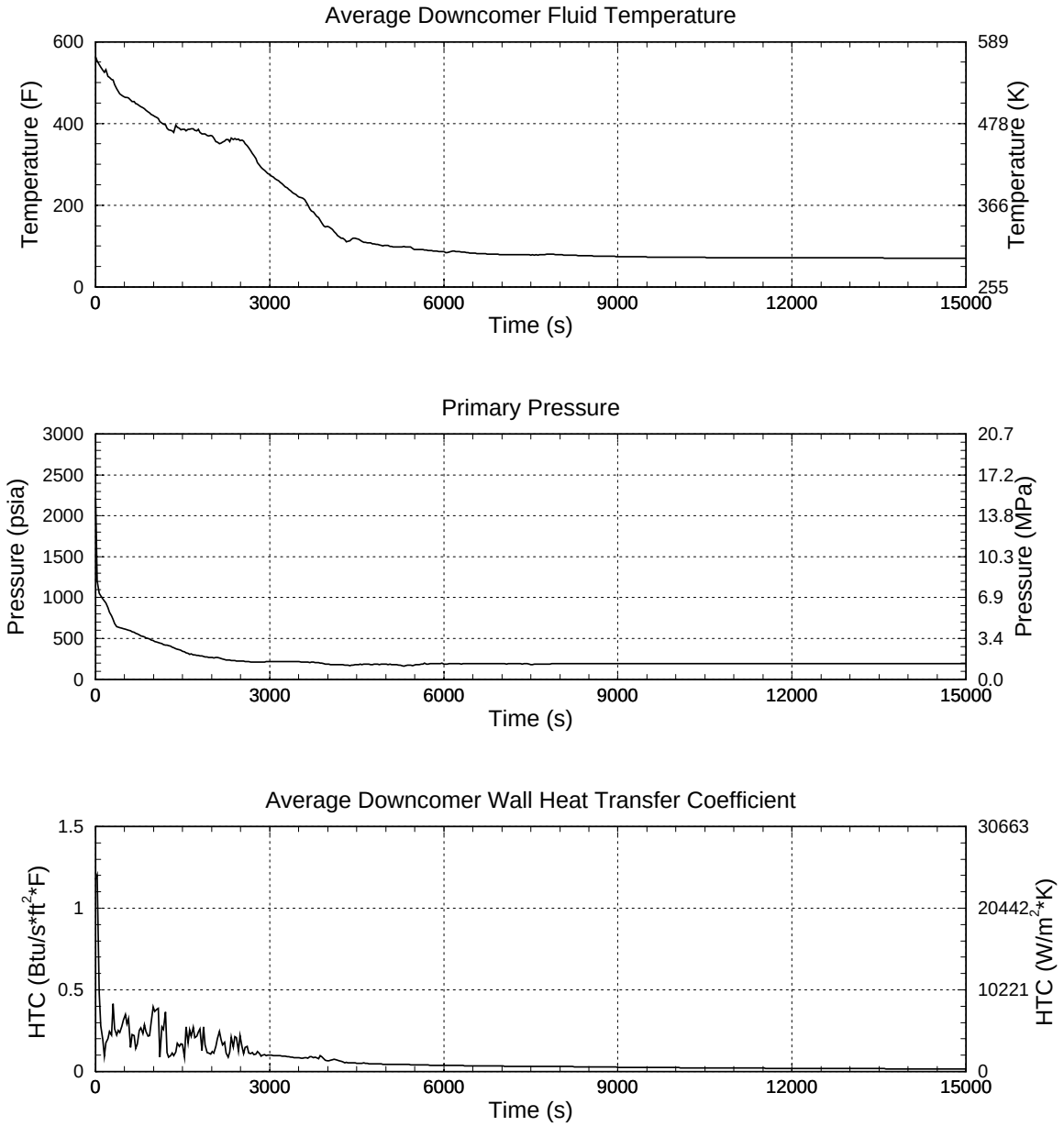


Figure A.2-10: Oconee PTS Results for Case 005

Case Category	LOCA
Primary Failures	3.59 cm (1.414 in) cold leg break
Secondary Failures	None
Operator Actions	None
Min DC Temp	497.9 K (436.5°F) at 9990 s
Comments	None.

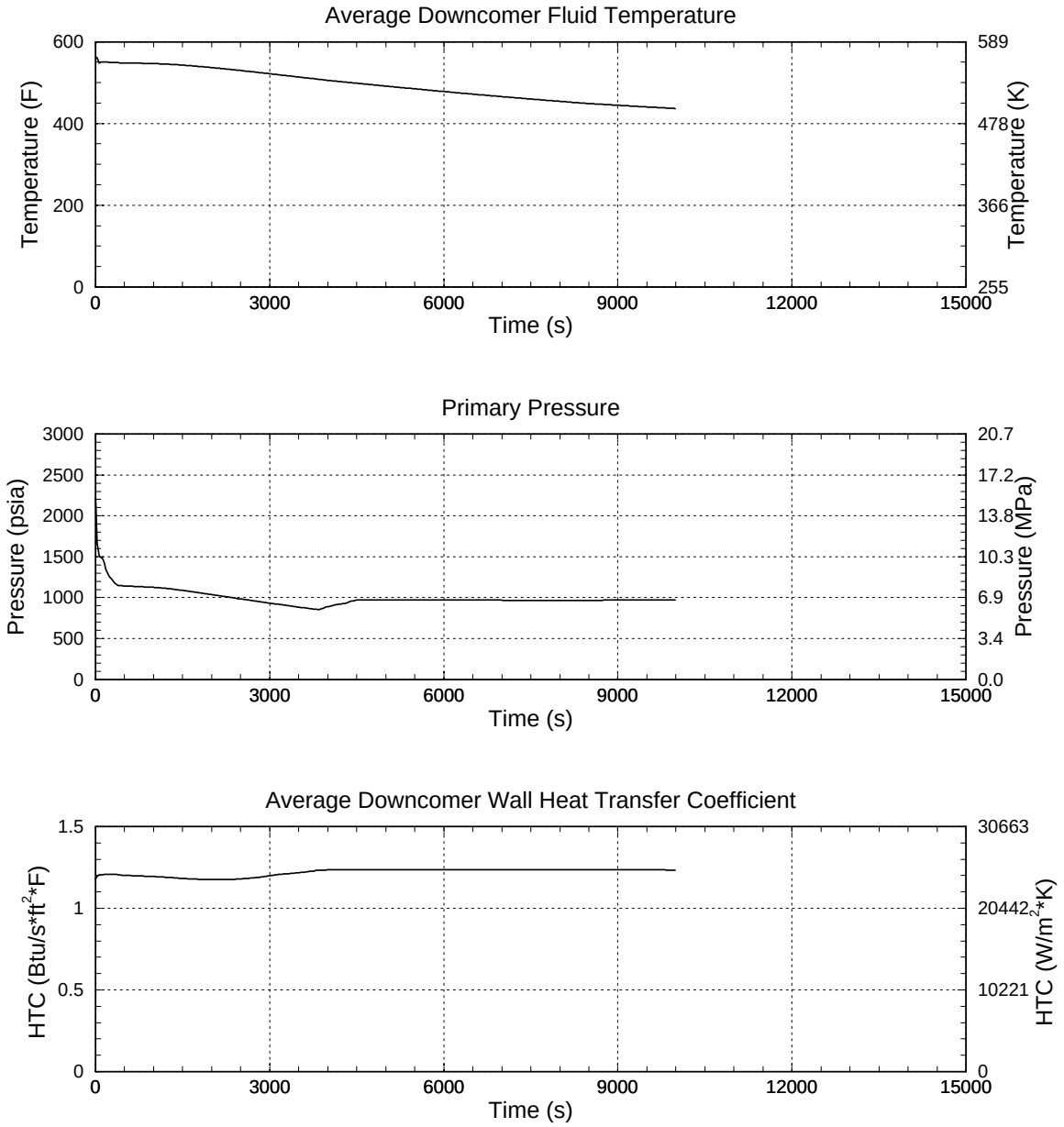


Figure A.2-11: Oconee PTS Results for Case 006

Case Category	LOCA
Primary Failures	5.08 cm (2 inch) cold leg break
Secondary Failures	None
Operator Actions	None
Min DC Temp	390.3 K (242.8°F) at 9990 s
Comments	None.

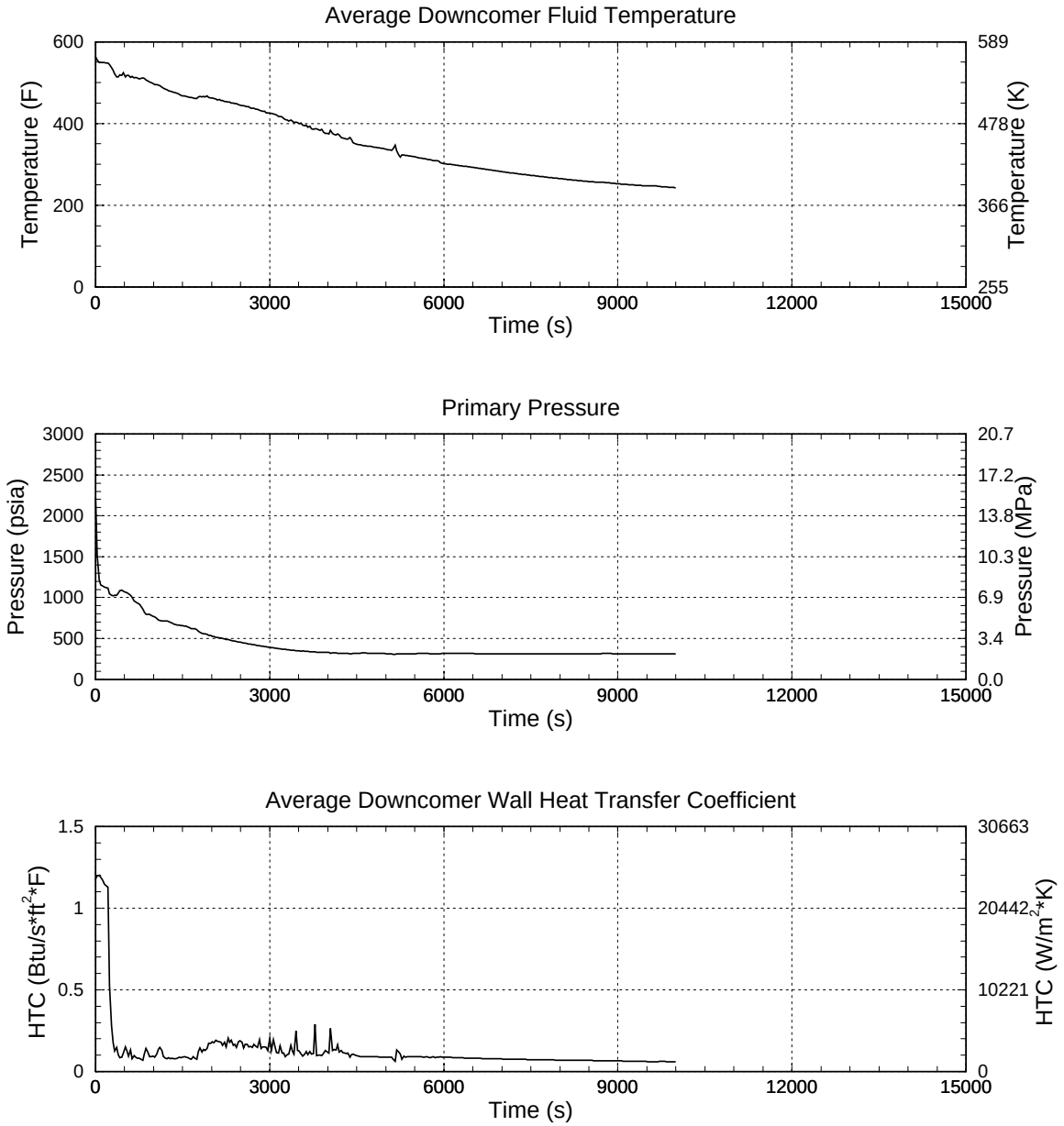


Figure A.2-12: Oconee PTS Results for Case 007

Case Category	LOCA
Primary Failures	2.54 cm (1 inch) surge line break
Secondary Failures	1 stuck open safety valve in SG-A
Operator Actions	None
Min DC Temp	441.9 K (335.7°F) at 9990 s
Comments	None.

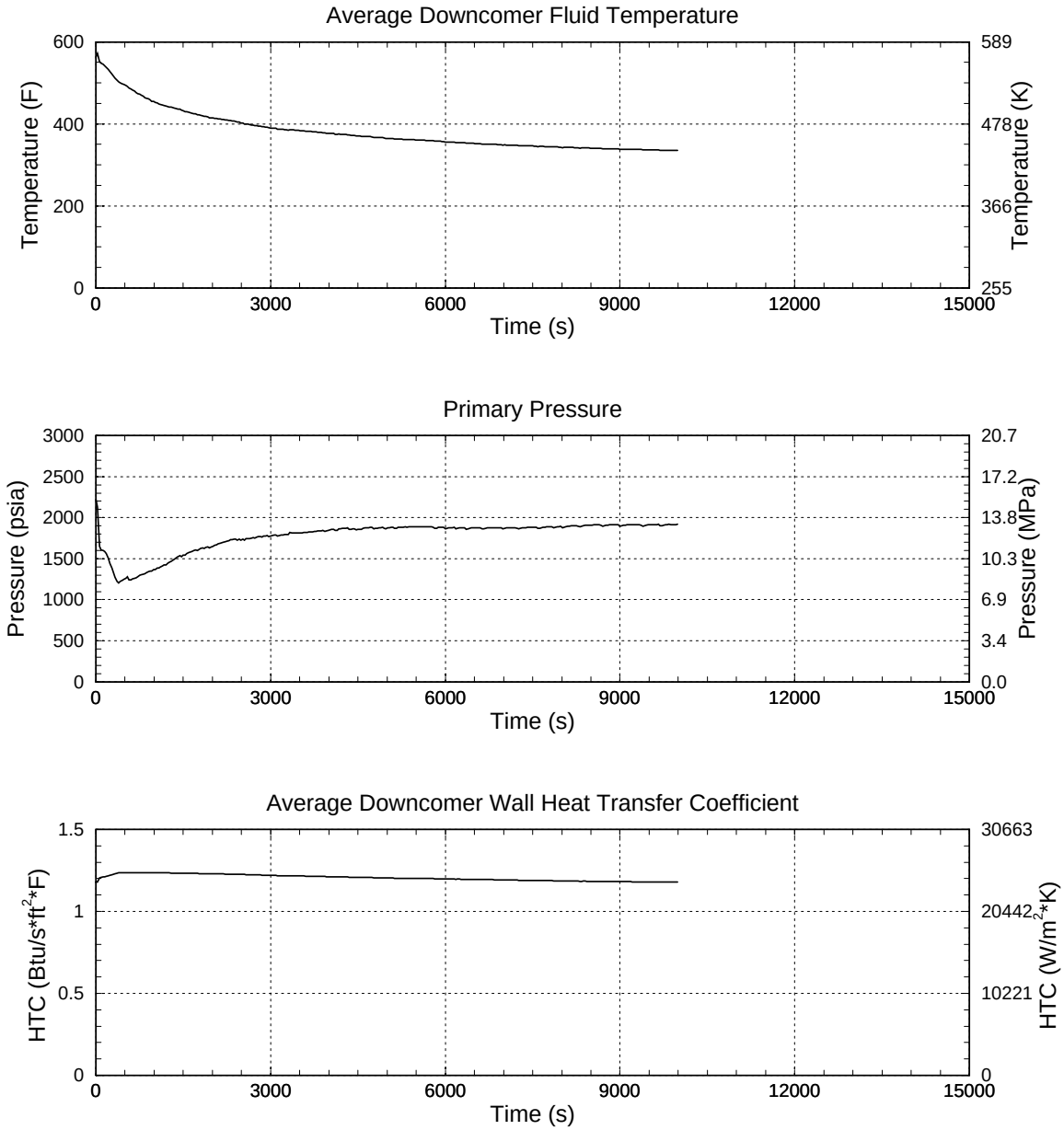


Figure A.2-13: Oconee PTS Results for Case 008

Case Category	LOCA
Primary Failures	2.54 cm (1 inch) surge line break
Secondary Failures	2 stuck open safety valves in SG-A
Operator Actions	None
Min DC Temp	424.7 K (304.8°F) at 9750 s
Comments	None.

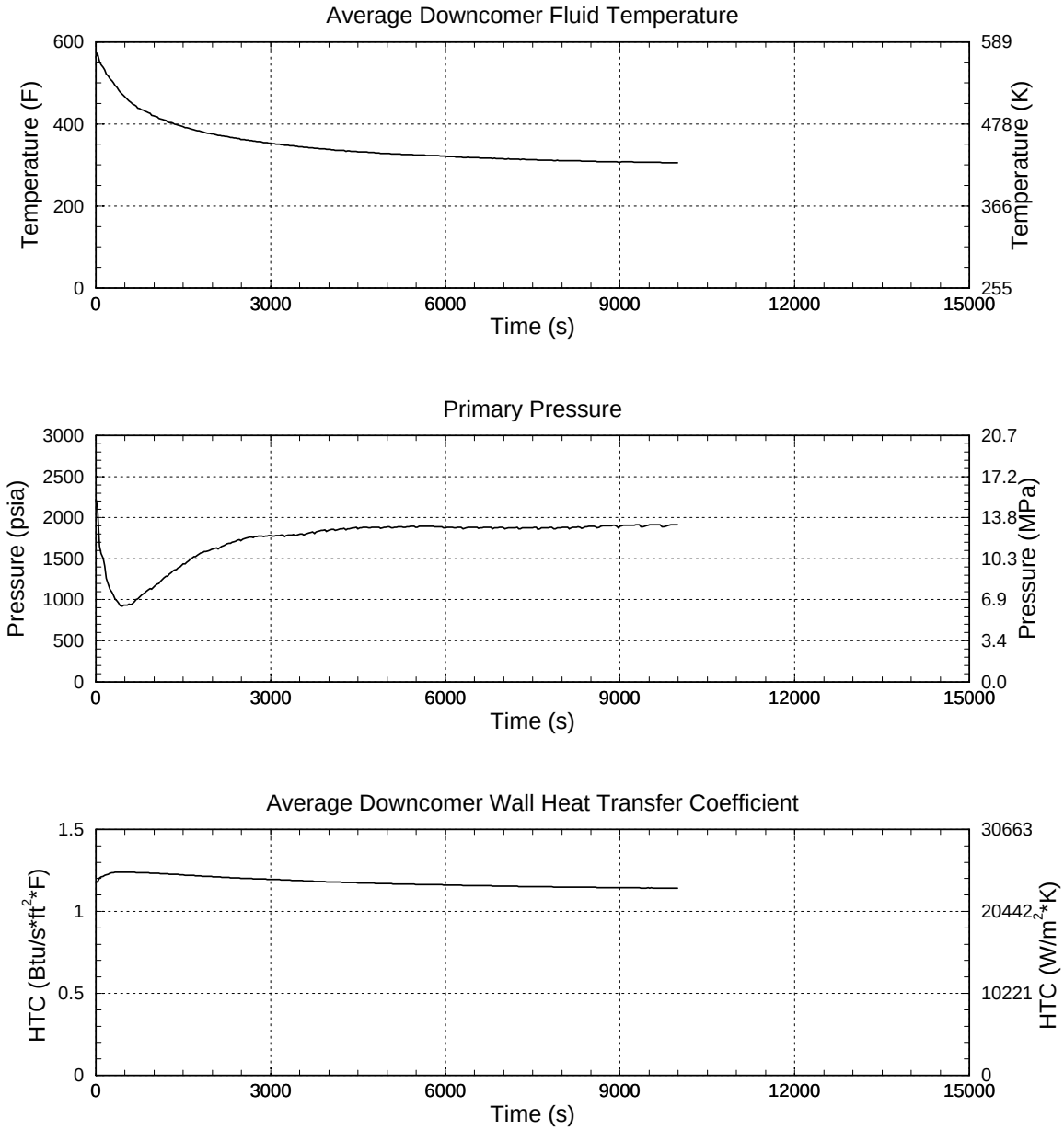


Figure A.2-14: Oconee PTS Results for Case 009

Case Category	LOCA
Primary Failures	3.59 cm (1.414 inches) surge line break
Secondary Failures	2 stuck open safety valves in SG-A
Operator Actions	None
Min DC Temp	415.6 K (288.5°F) at 9990 s
Comments	None.

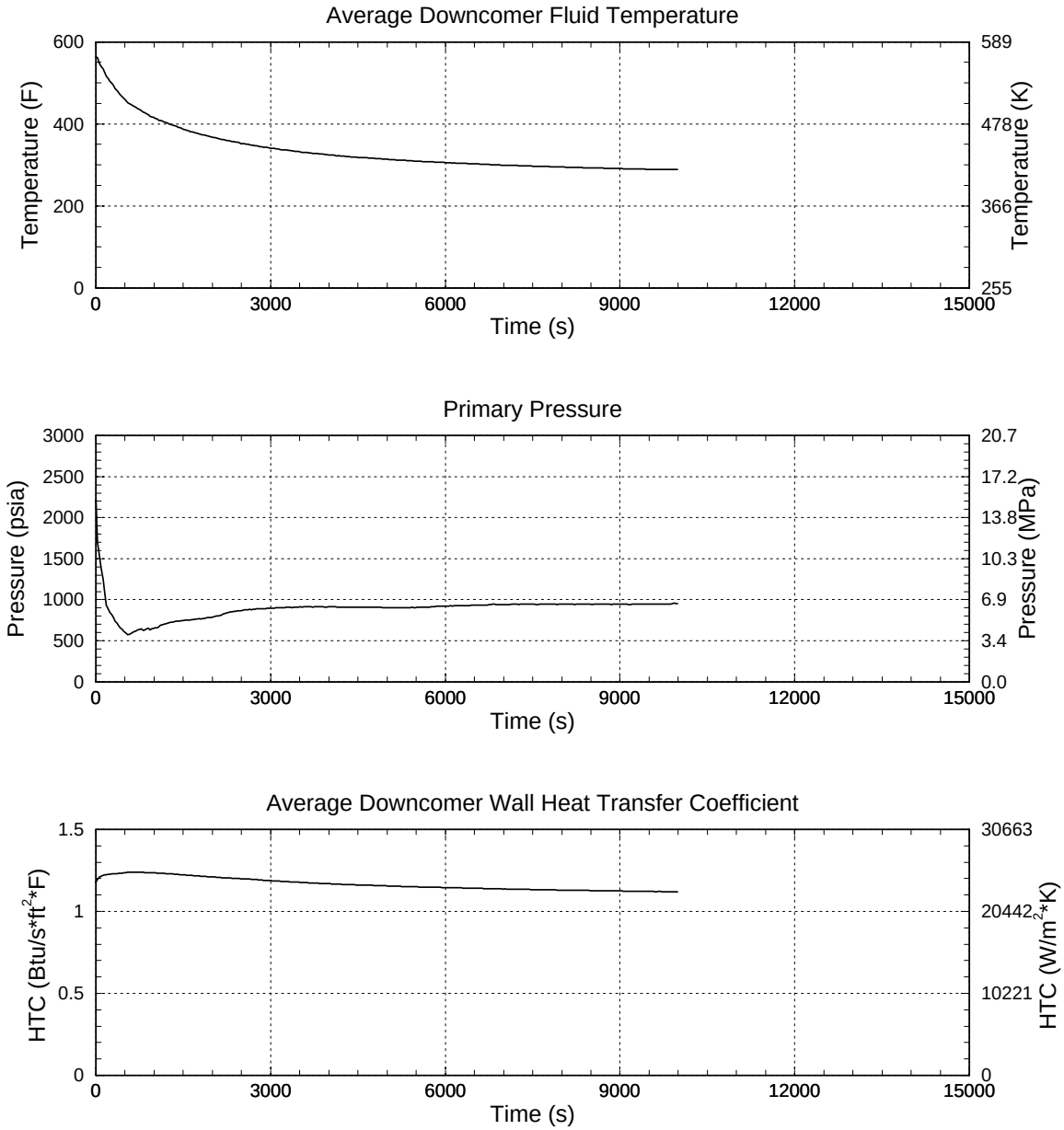


Figure A.2-15: Oconee PTS Results for Case 010

Case Category	LOCA
Primary Failures	2.54 cm (1 inch) surge line break
Secondary Failures	1 stuck open safety valve in SG-A
Operator Actions	HPI terminated when subcooling margin exceeds 55.6 K (100°F)
Min DC Temp	482.3 K (408.5°F) at 2310 s
Comments	None.

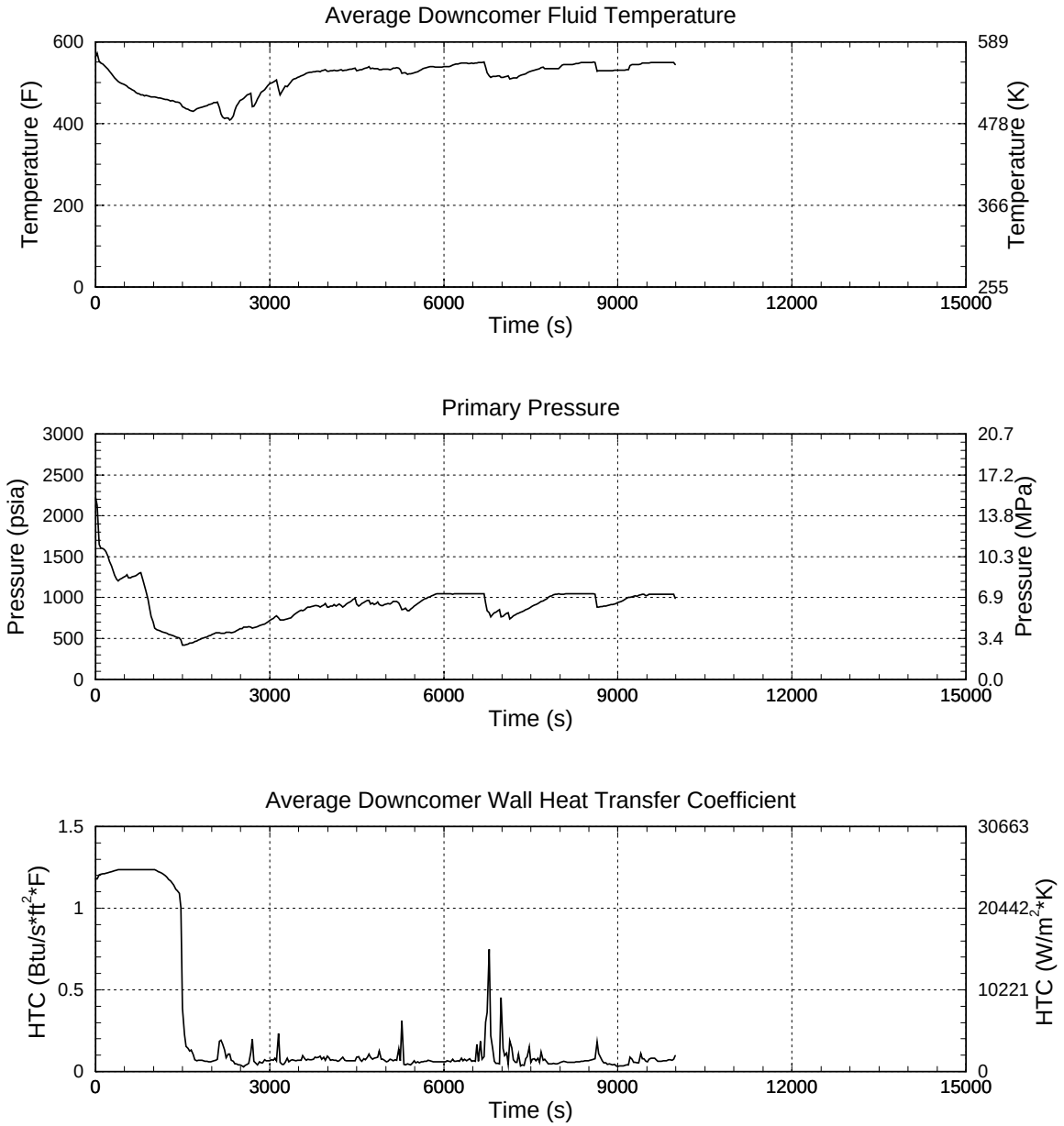


Figure A.2-16: Oconee PTS Results for Case 011

Case Category	LOCA
Primary Failures	2.54 cm (1 inch) surge line break
Secondary Failures	1 stuck open safety valve in SG-A
Operator Actions	HPI throttled to maintain 27.8 K (50°F) subcooling margin
Min DC Temp	460.9 K (369.9°F) at 9690 s
Comments	None.

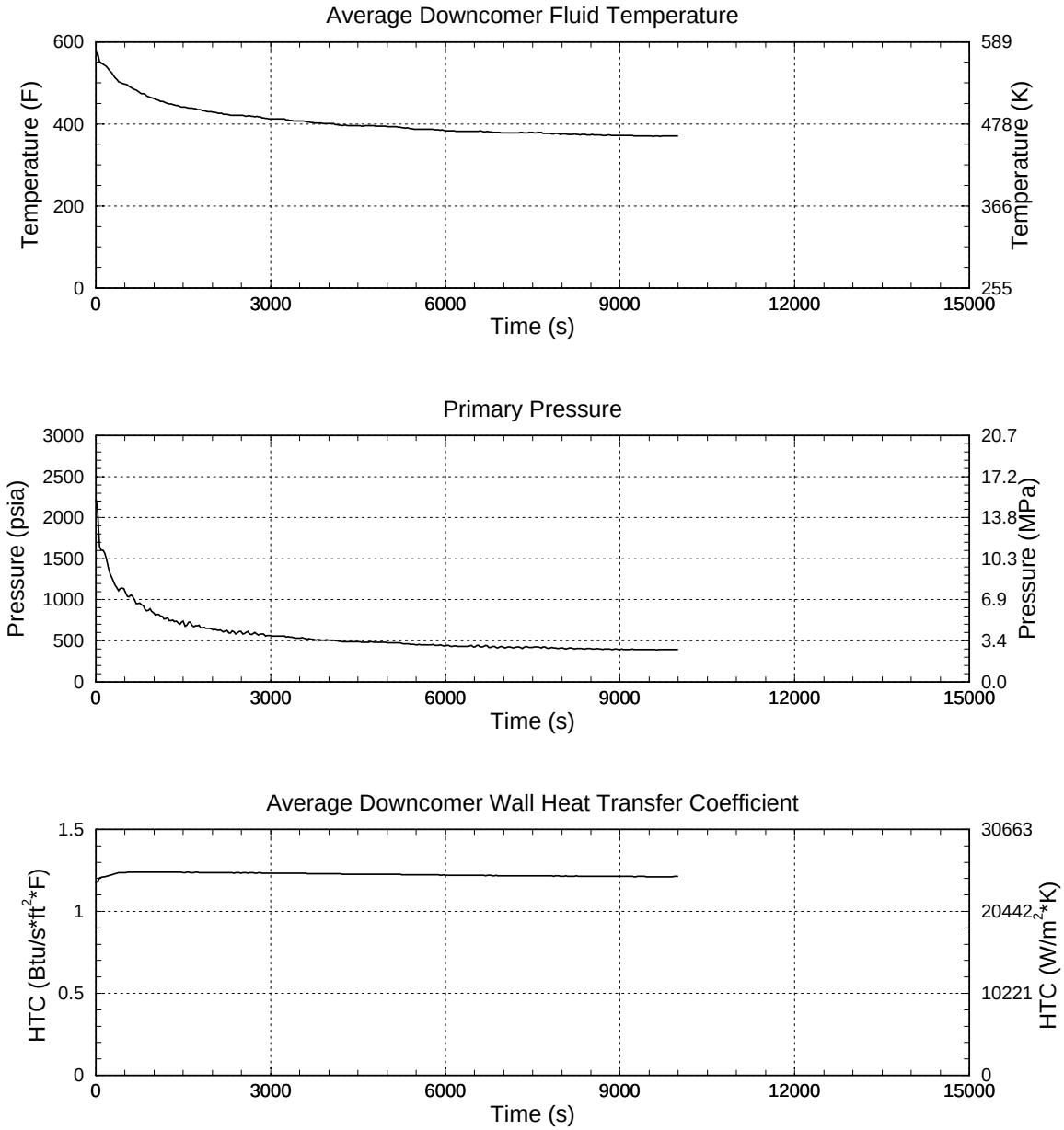


Figure A.2-17: Oconee PTS Results for Case 012

Case Category	LOCA
Primary Failures	2.54 cm (1 inch) surge line break
Secondary Failures	2 stuck open safety valves in SG-A
Operator Actions	HPI terminated when subcooling margin exceeds 55.6 K (100°F)
Min DC Temp	409.7 K (277.7°F) at 9870 s
Comments	None.

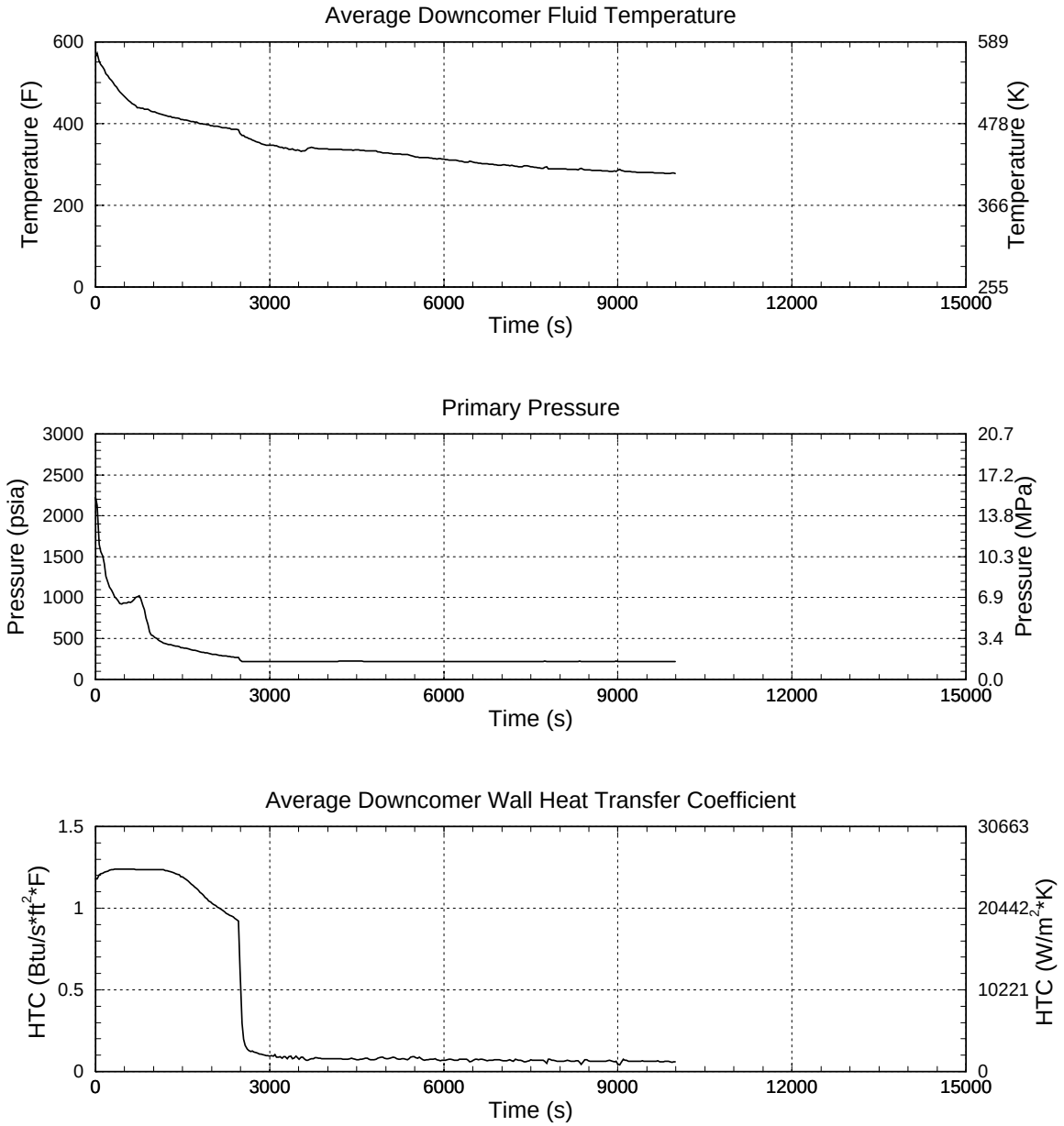


Figure A.2-18: Oconee PTS Results for Case 013

Case Category	LOCA
Primary Failures	3.59 cm (1.414 in) surge line break
Secondary Failures	None
Operator Actions	Operator is assumed to trip the reactor coolant pumps at 2.778 K (5°F) subcooling.
Min DC Temp	400.9 K (262.0°F) at 9990 s
Comments	None.

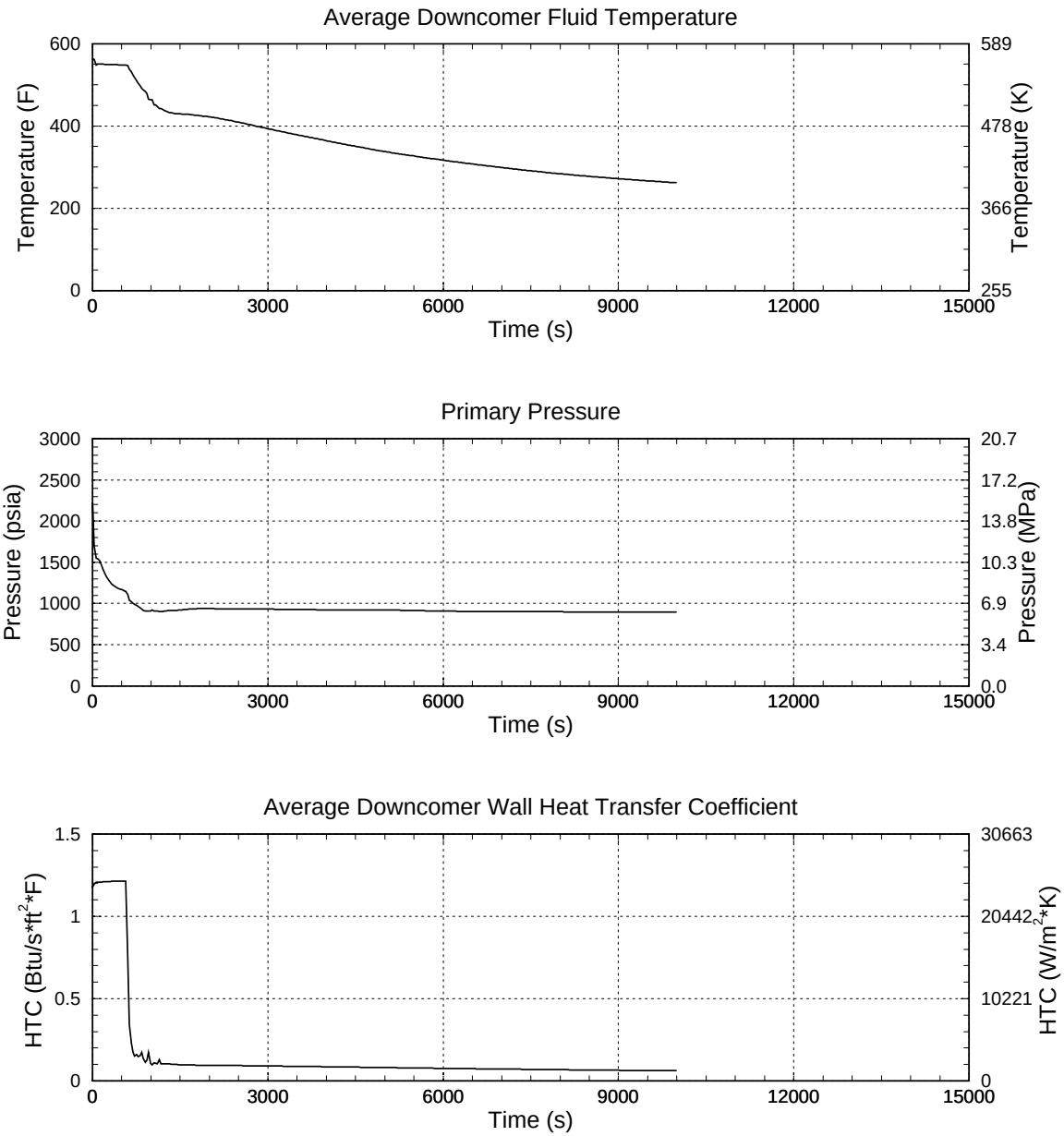


Figure A.2-19: Oconee PTS Results for Case 014

Case Category	LOCA
Primary Failures	2.54 cm (1 in) surge line break with HPI Failure
Secondary Failures	None
Operator Actions	At 15 minutes after transient initiation, operator opens all TBVs to lower primary system pressure and allow CFT and LPI injection.
Min DC Temp	345.6 K (162.5°F) at 7020 s
Comments	None.

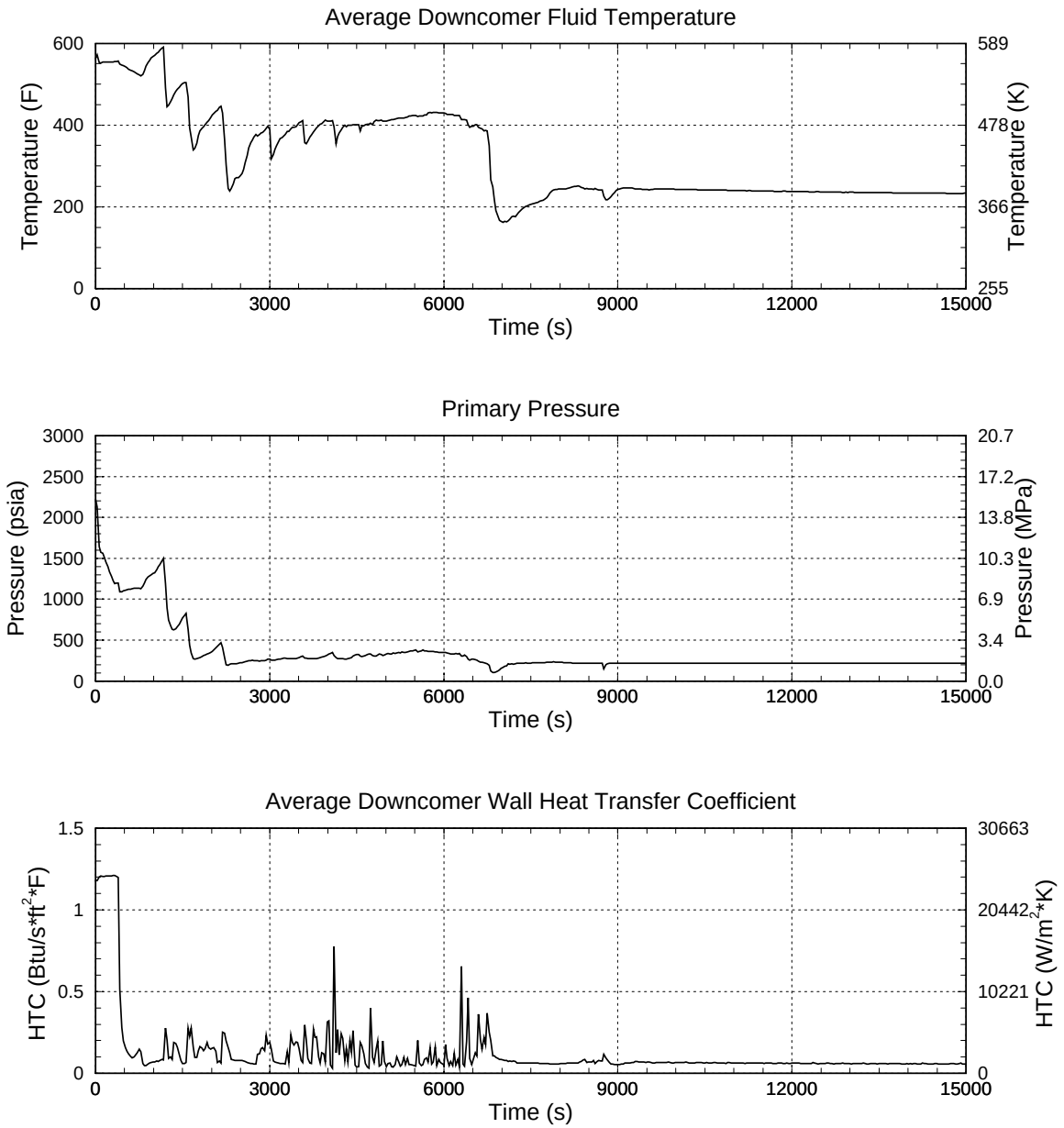


Figure A.2-20: Oconee PTS Results for Case 015

Case Category	LOCA - HZP
Primary Failures	2.54 cm (1 in) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	492.3 K (426.4°F) at 9990 s
Comments	None.

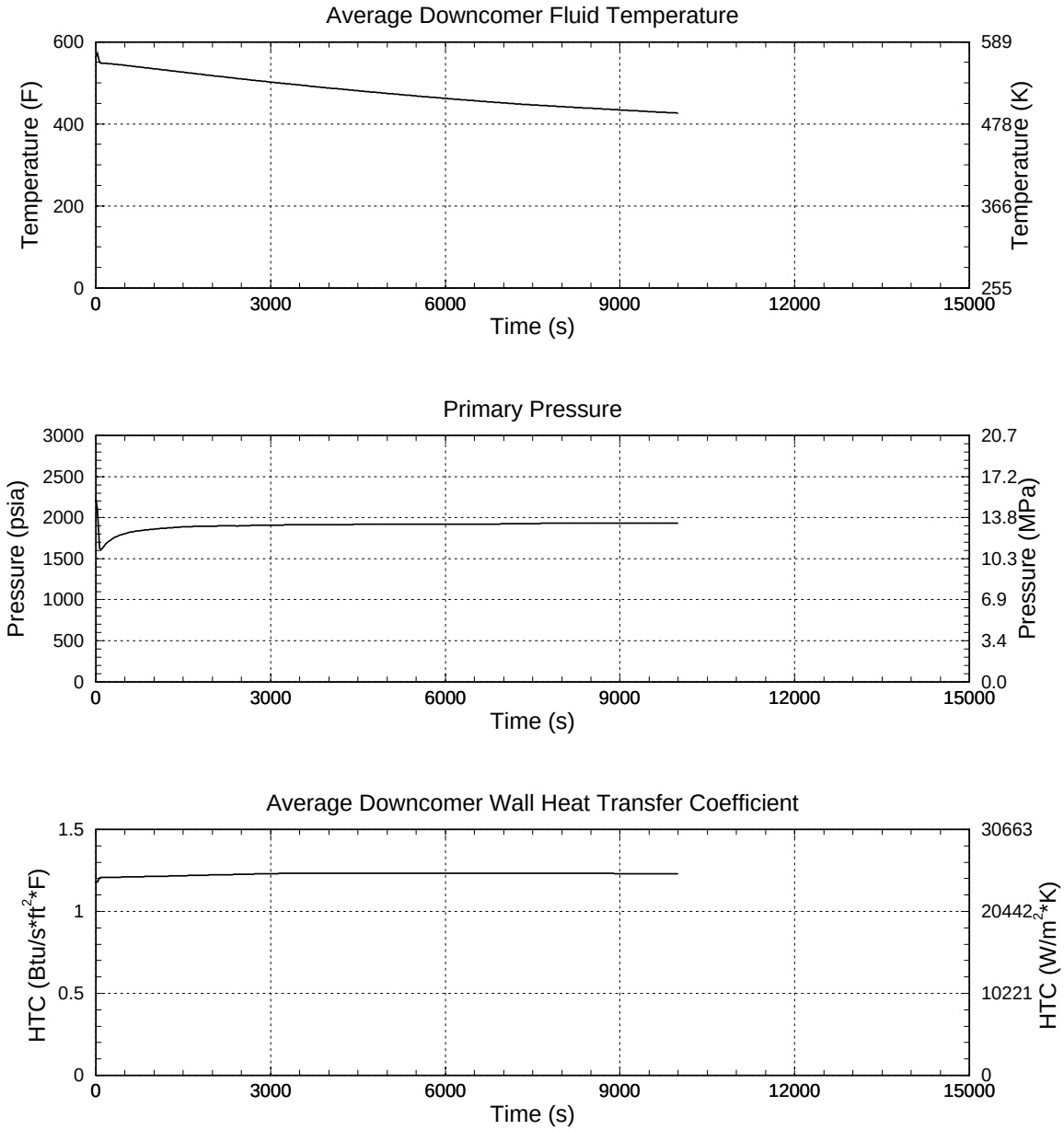


Figure A.2-21: Oconee PTS Results for Case 016

Case Category	LOCA - HZP
Primary Failures	2.54 cm (1 in) surge line break
Secondary Failures	1 stuck open safety valve in SG-A
Operator Actions	None
Min DC Temp	416.9 K (290.7°F) at 9990 s
Comments	None.

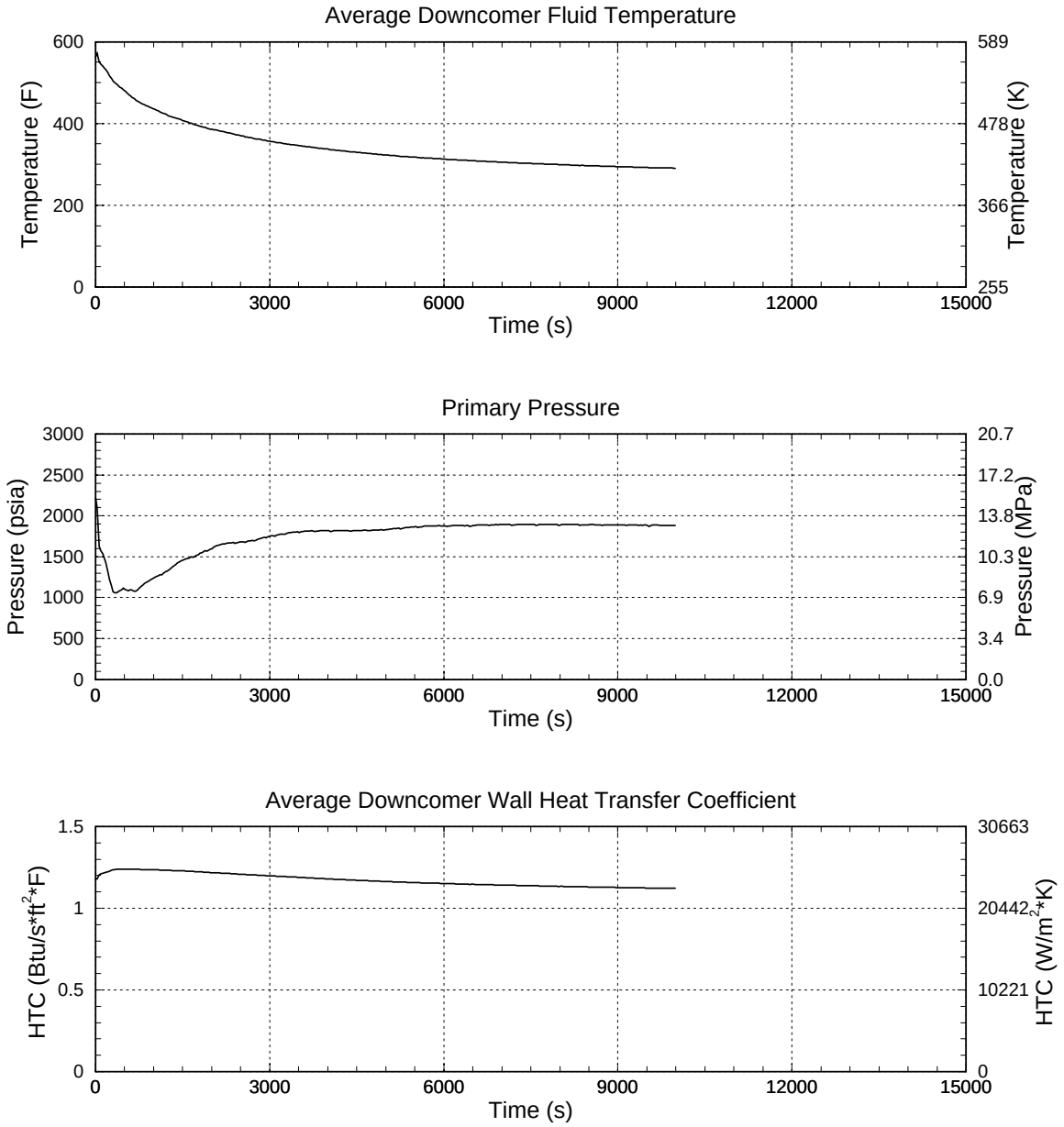


Figure A.2-22: Oconee PTS Results for Case 017

Case Category	TT/RT
Primary Failures	None
Secondary Failures	SG level control system failure causes SG overfill.
Operator Actions	Operator is assumed to shut off the emergency feedwater system when the level reaches 96% operating range.
Min DC Temp	539.5 K (511.4°F) at 870 s
Comments	None.

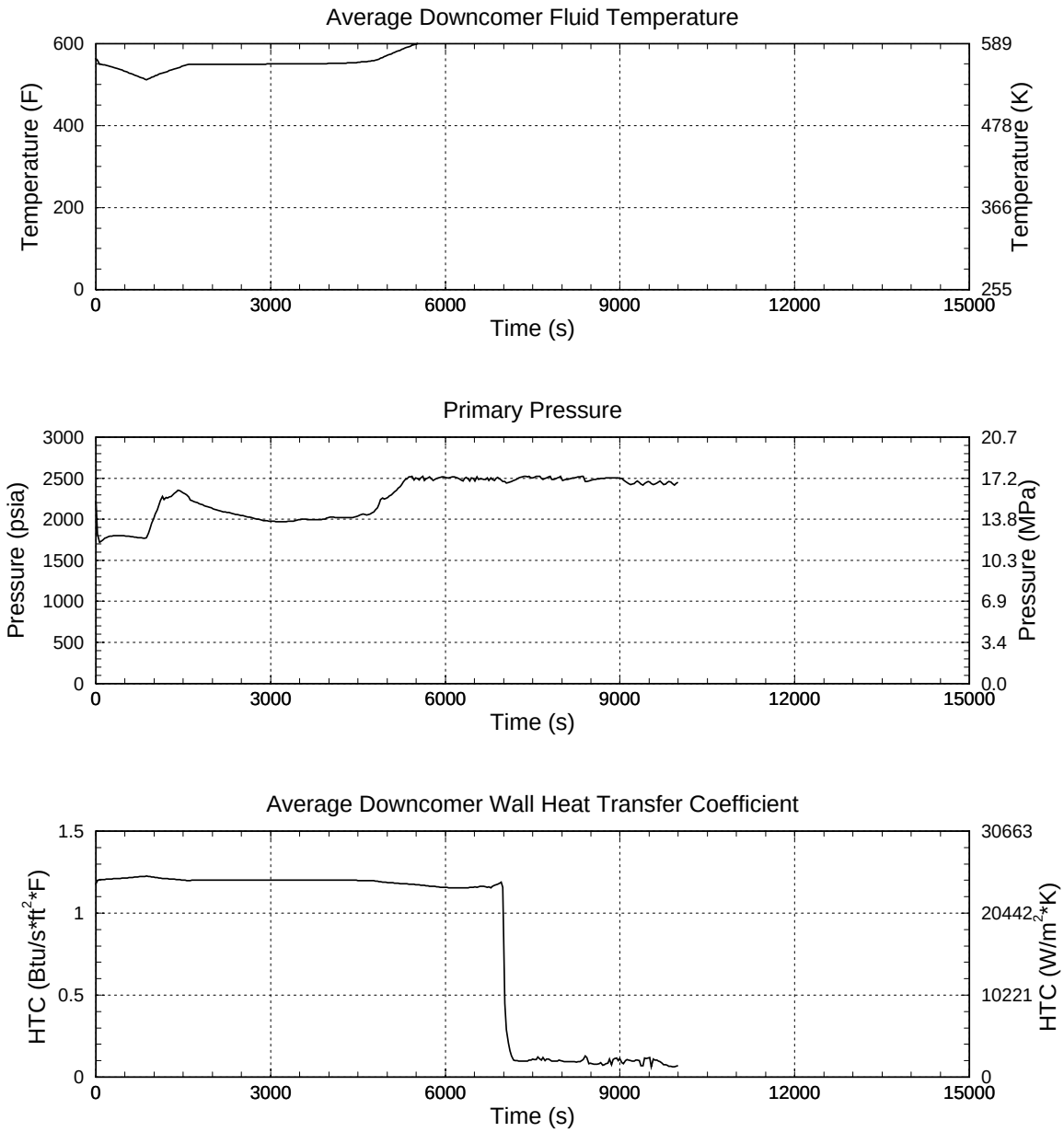


Figure A.2-23: Oconee PTS Results for Case 018

Case Category	TT/RT
Primary Failures	None
Secondary Failures	SG level control system failure causes SG overfill. EFW continues running and the SGs flood and remain flooded.
Operator Actions	Operator throttles EFW, maintaining flooded SGs without flooding the steam lines.
Min DC Temp	537.5 K (507.9°F) at 930 s
Comments	None.

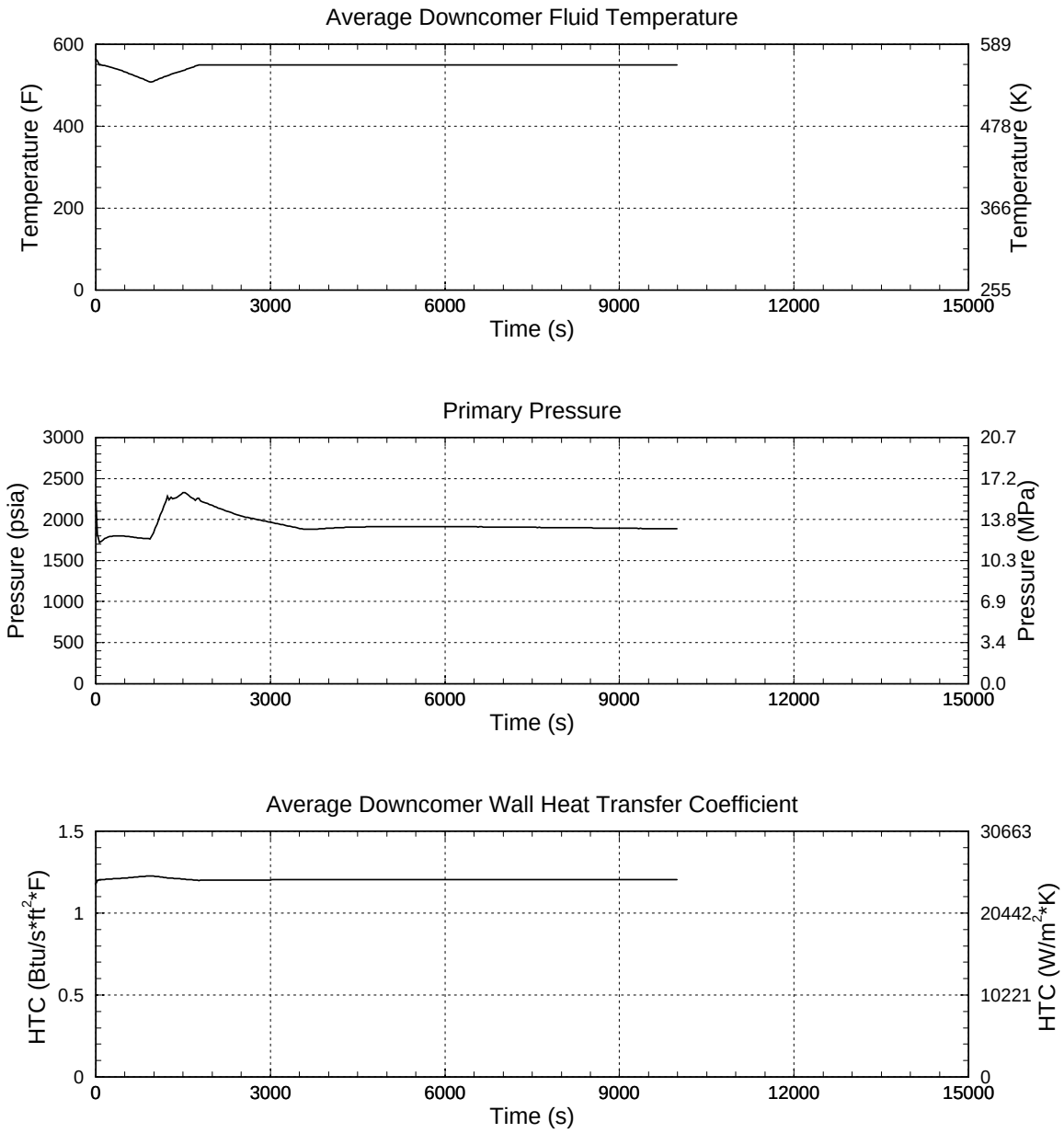


Figure A.2-24: Oconee PTS Results for Case 019

Case Category	TT/RT
Primary Failures	None
Secondary Failures	One stuck open TBV in SG-A
Operator Actions	Operator throttles HPI to maintain a level of 5.59 m (220 in) in the pressurizer
Min DC Temp	476.6 K (398.2°F) at 9870 s
Comments	None.

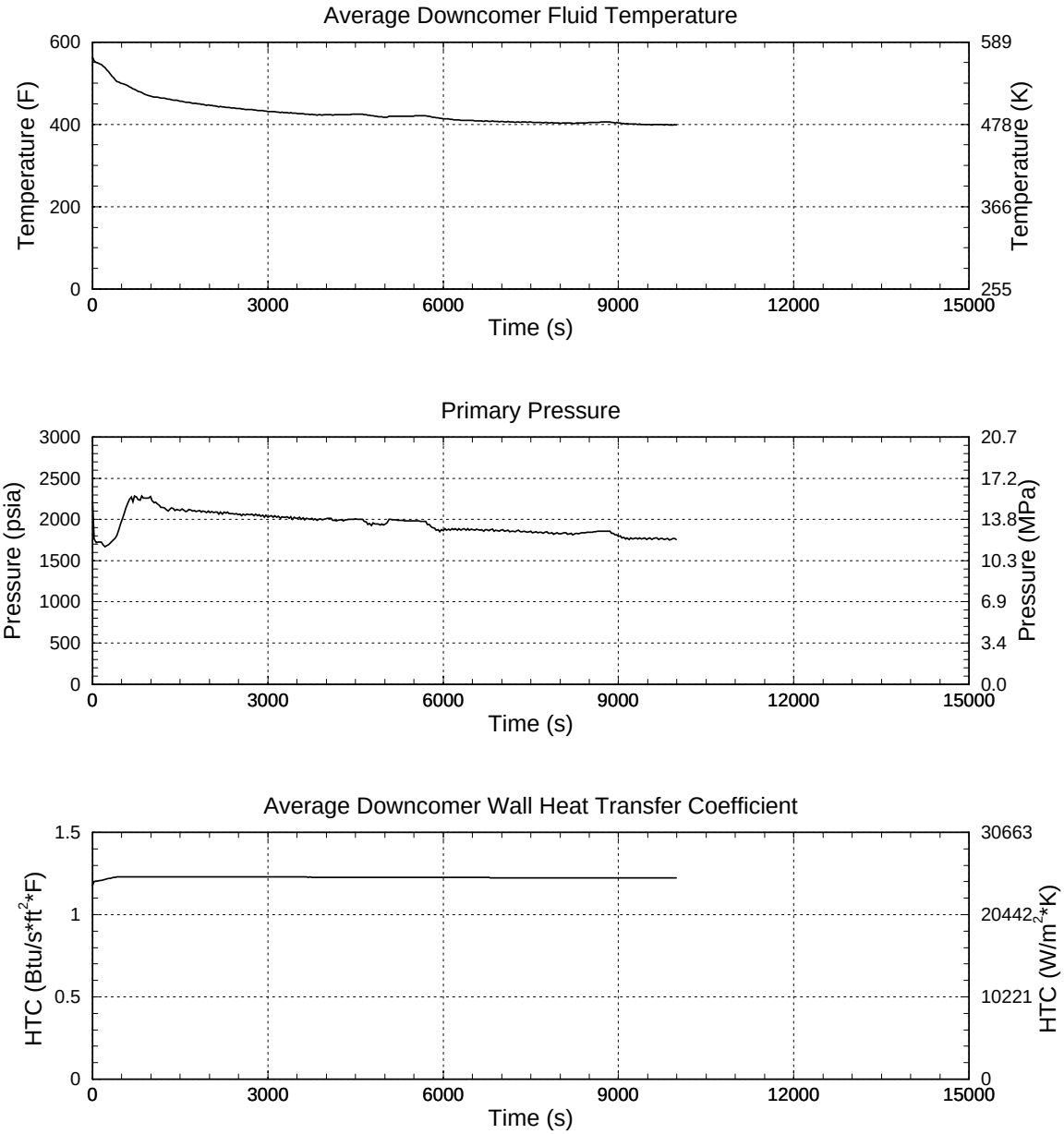
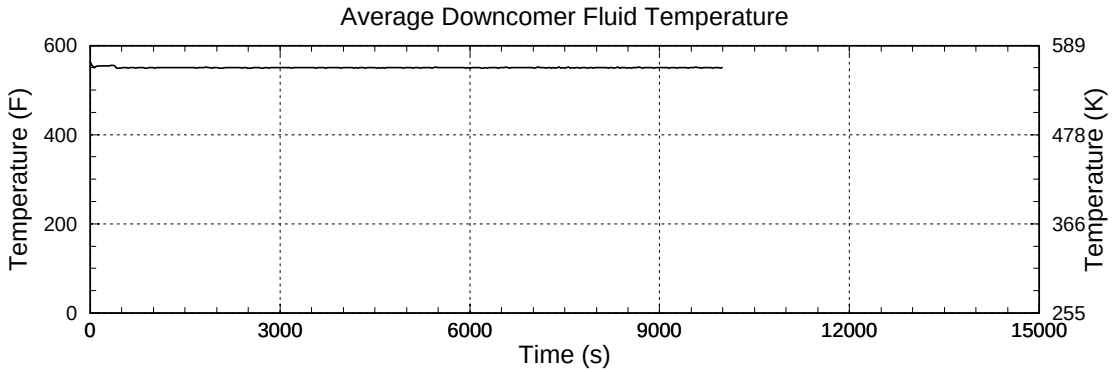
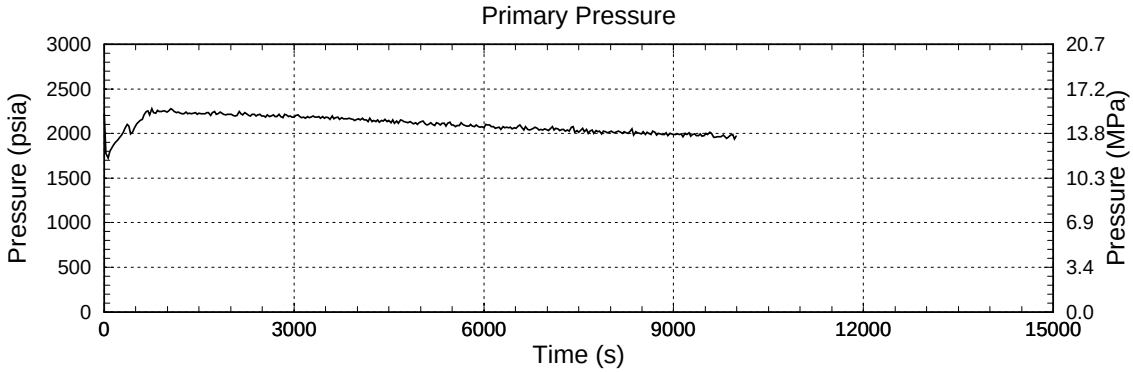


Figure A.2-25: Oconee PTS Results for Case 020

Case Category	TT/RT
Primary Failures	None
Secondary Failures	None
Operator Actions	None
Min DC Temp	560.5 K (549.3°F) at 7020 s
Comments	None.





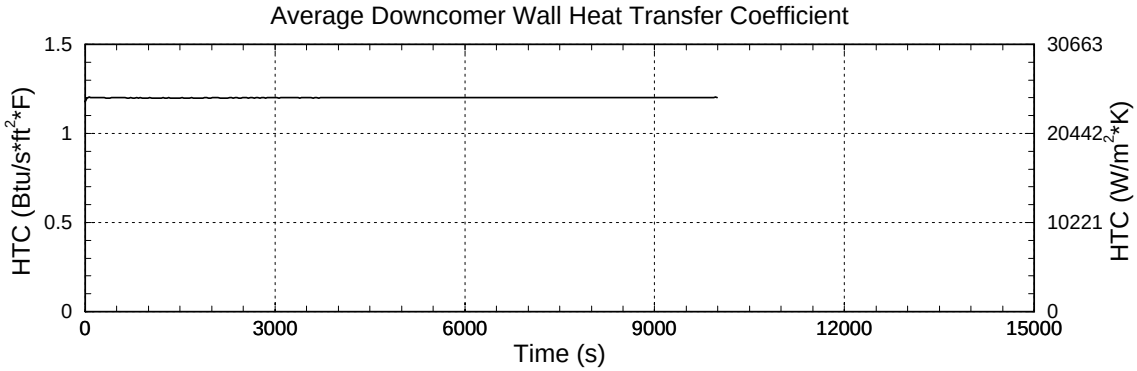


Figure A.2-26: Oconee PTS Results for Case 021

Case Category	TT/RT
Primary Failures	Stuck open PORV
Secondary Failures	TBVs kept closed to force PORV to open.
Operator Actions	None
Min DC Temp	516.0 K (469.2°F) at 9990 s
Comments	None.

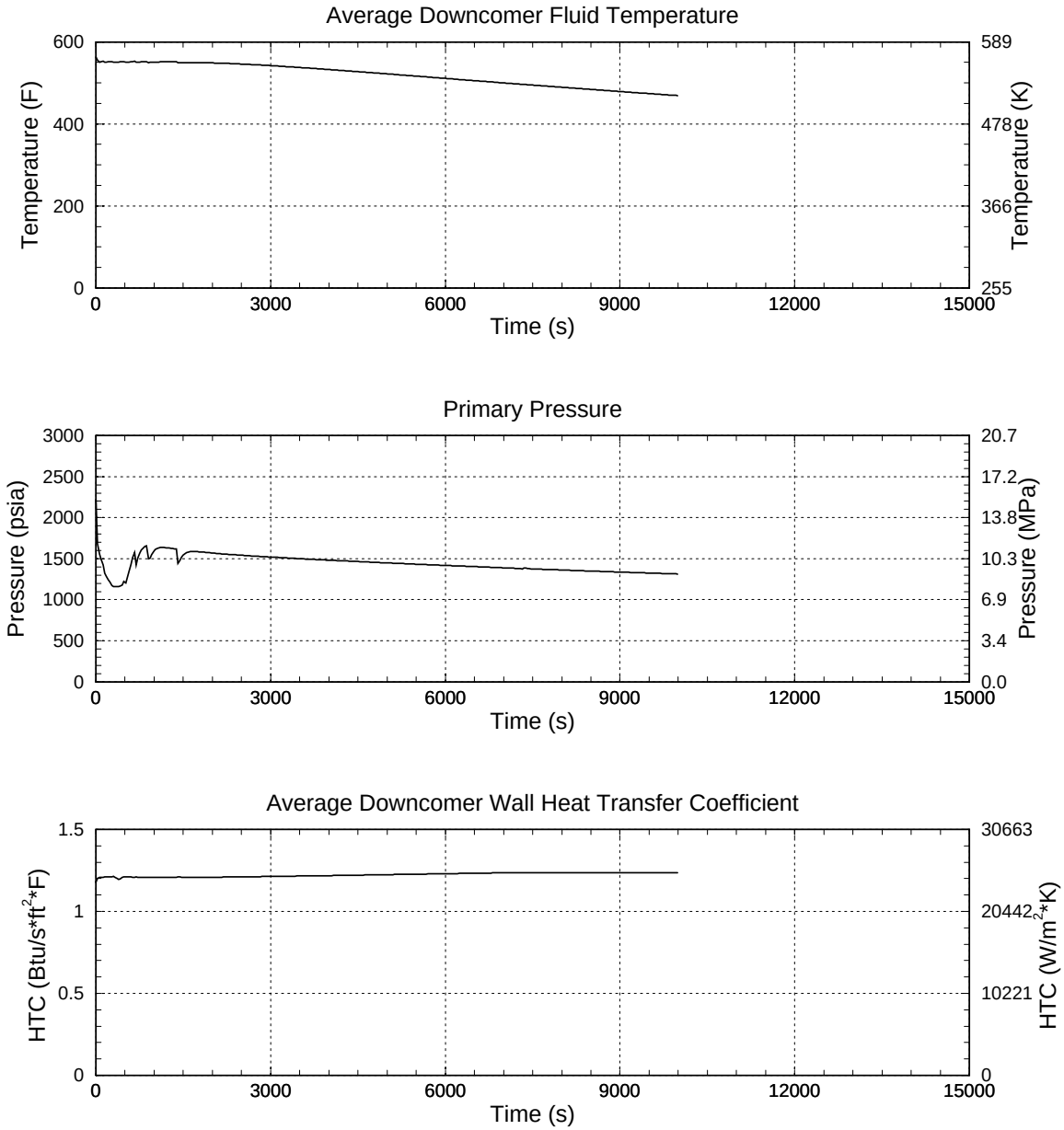


Figure A.2-27: Oconee PTS Results for Case 022

Case Category	TT/RT
Primary Failures	None
Secondary Failures	SG level control system failure causes SG overfill. EFW continues running and the SGs flood and remain flooded.
Operator Actions	Operator trips MFW and turbine driven EFW. Motor driven EFW remains running.
Min DC Temp	510.1 K (458.5°F) at 9990 s
Comments	None.

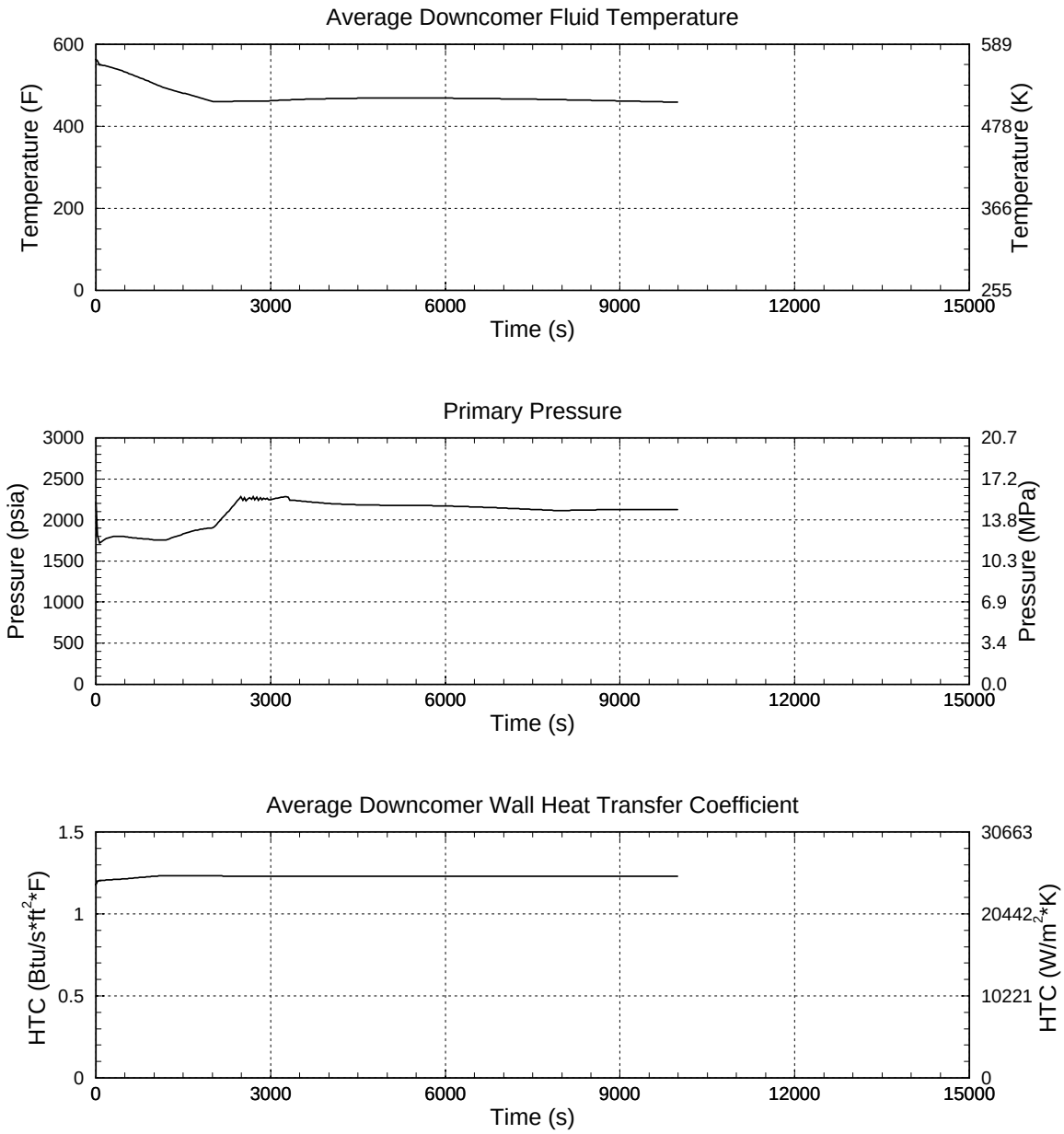


Figure A.2-28: Oconee PTS Results for Case 023

Case Category	TT/RT
Primary Failures	None
Secondary Failures	SG level control system failure causes SG overfill. MFW continues running and the SGs flood.
Operator Actions	Operator trips MFW when water enters the steam lines.
Min DC Temp	554.2 K (537.9°F) at 300 s
Comments	None.

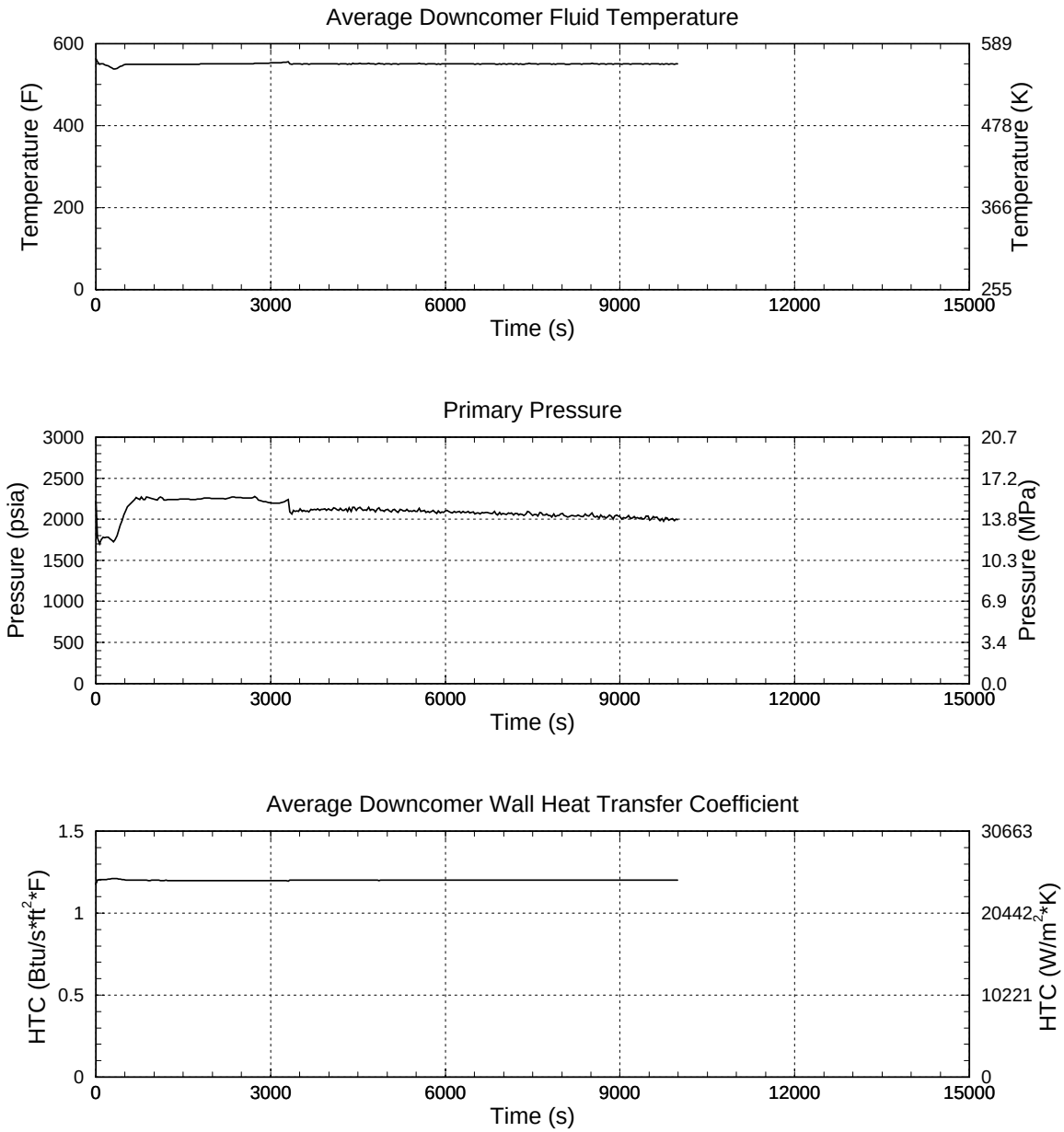


Figure A.2-29: Oconee PTS Results for Case 024

Case Category	MSLB
Primary Failures	None
Secondary Failures	MSLB with trip of turbine driven emergency feedwater by the MSLB circuitry.
Operator Actions	None
Min DC Temp	378.4 K (221.4°F) at 8820 s
Comments	None.

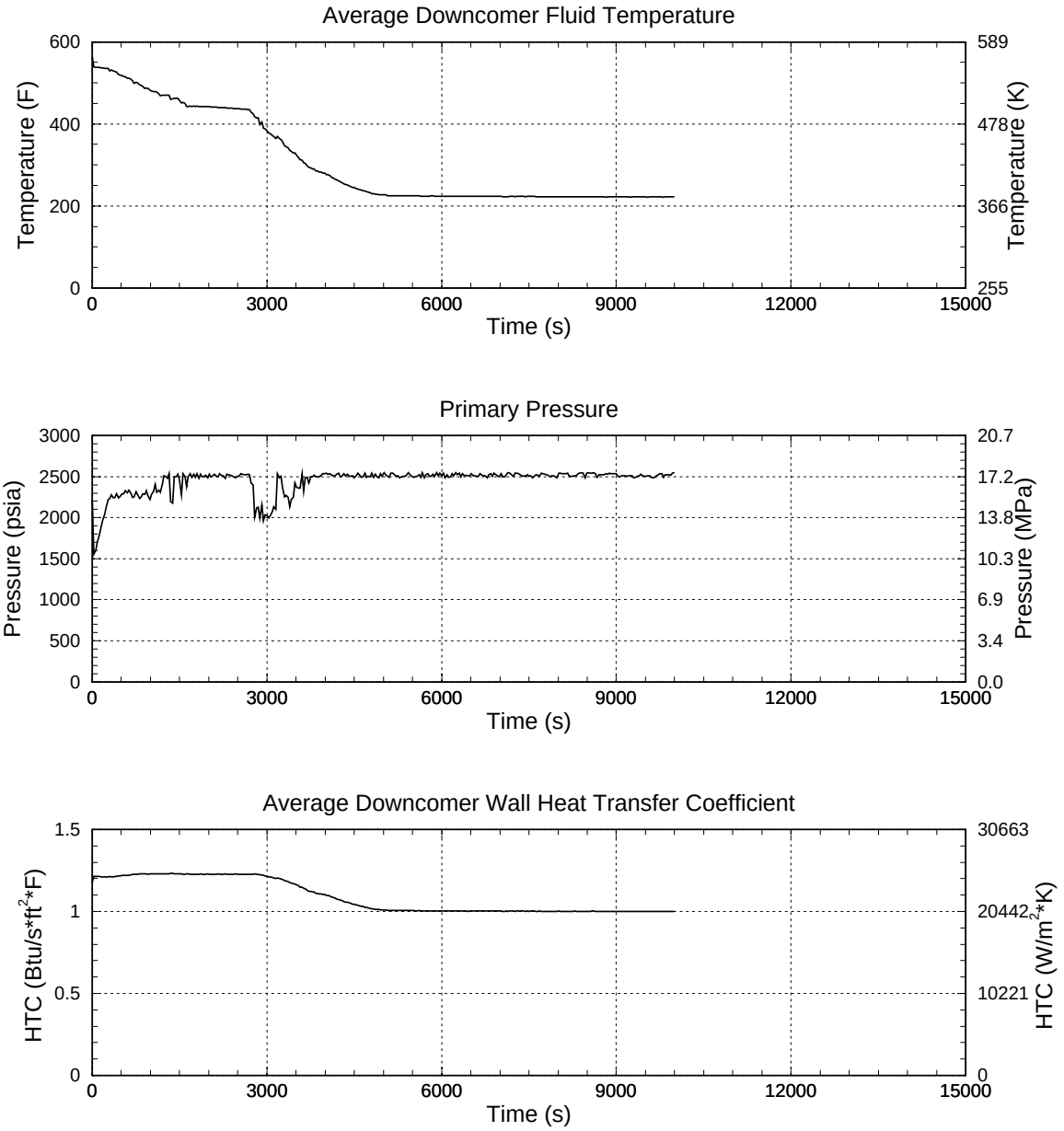


Figure A.2-30: Oconee PTS Results for Case 025

Case Category	MSLB
Primary Failures	None
Secondary Failures	MSLB without trip of turbine driven emergency feedwater
Operator Actions	None
Min DC Temp	378.4 K (221.5°F) at 9960 s
Comments	None.

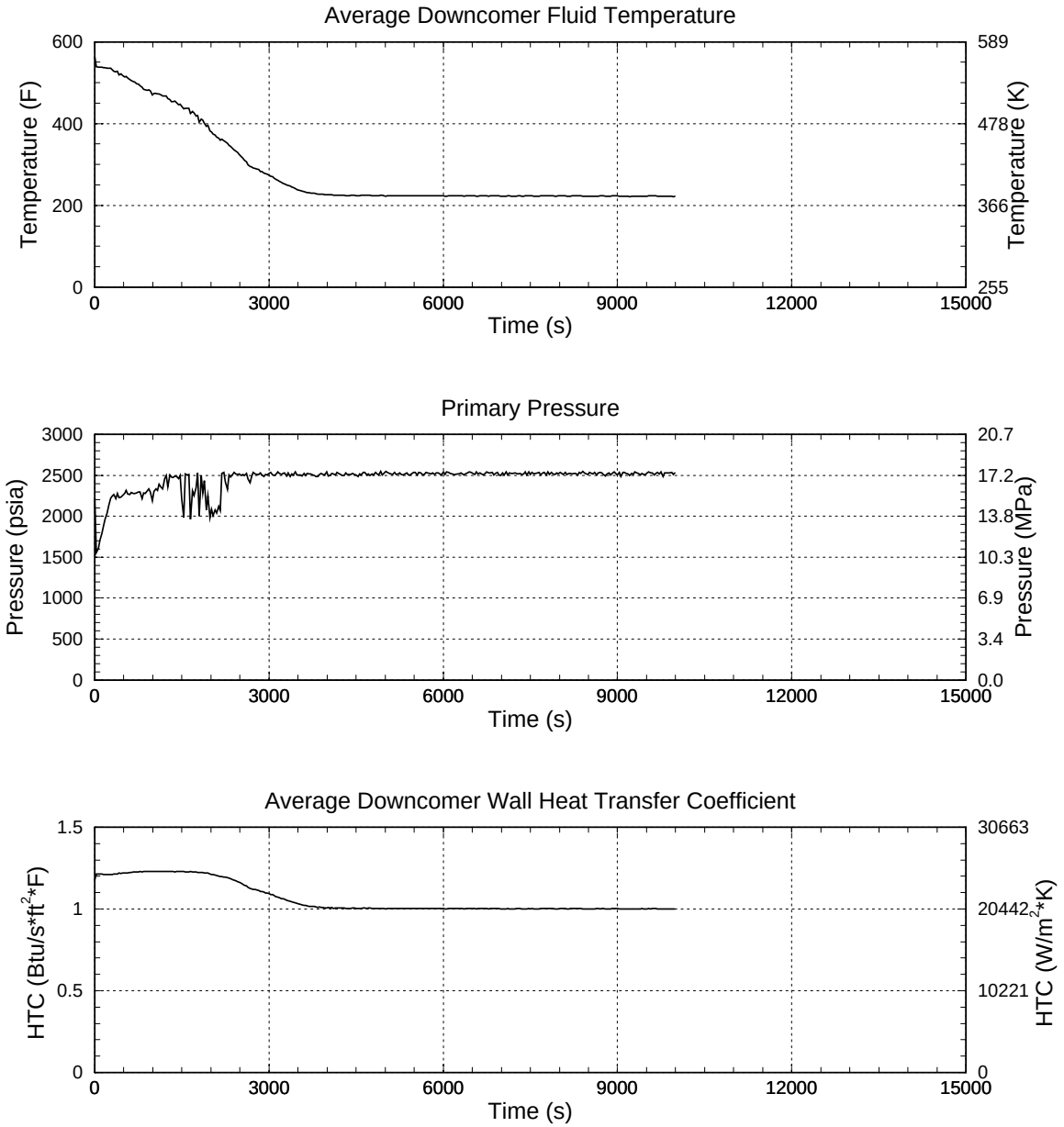


Figure A.2-31: Oconee PTS Results for Case 026

Case Category	MSLB
Primary Failures	None
Secondary Failures	MSLB without trip of turbine driven emergency feedwater.
Operator Actions	Operator throttles HPI to maintain 27.8 K (50°F) subcooling margin.
Min DC Temp	379.0 K (222.6°F) at 14550 s
Comments	None.

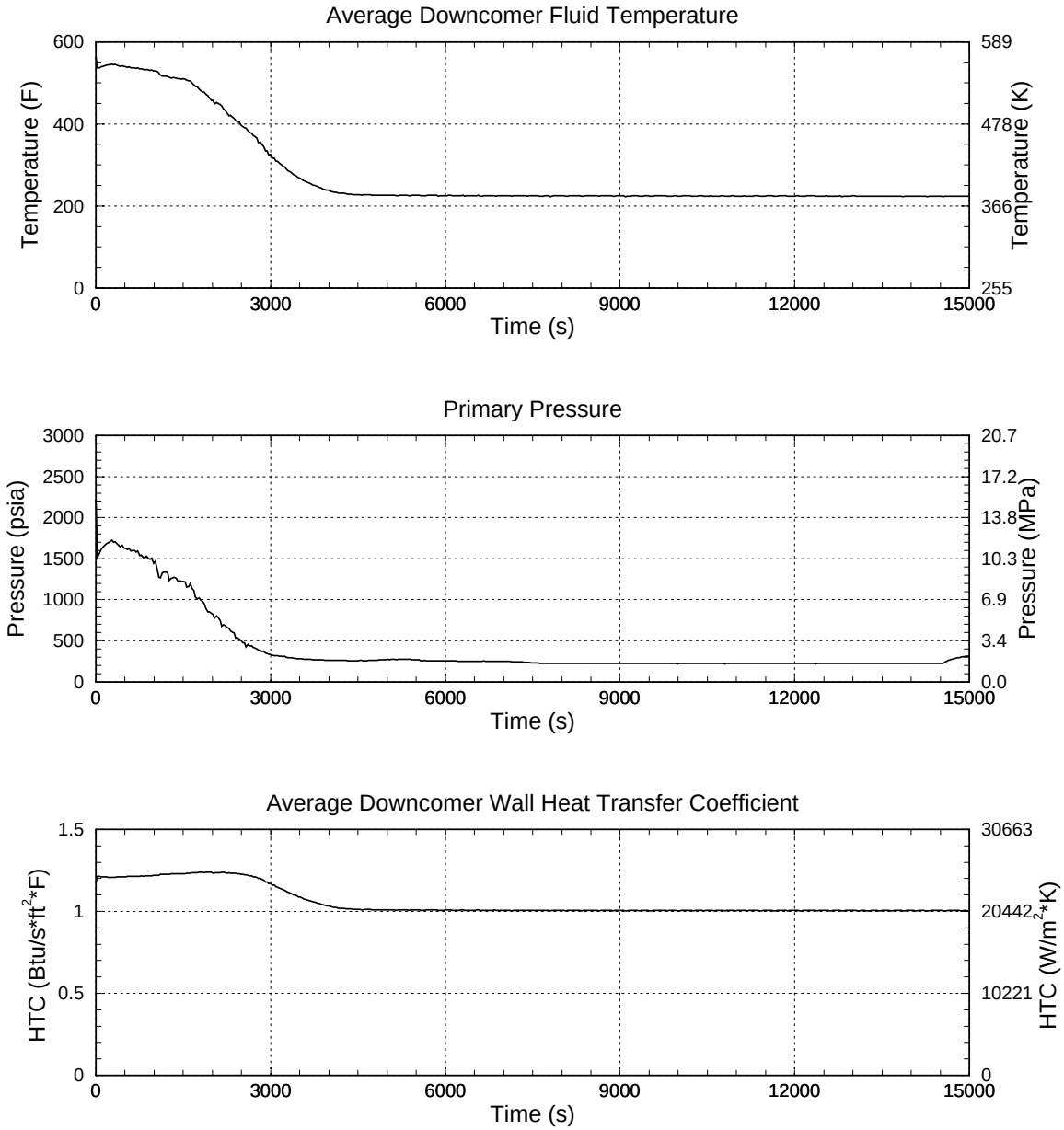


Figure A.2-32: Oconee PTS Results for Case 027

Case Category	TT/RT
Primary Failures	None
Secondary Failures	1 stuck open safety valve in SG-A
Operator Actions	None
Min DC Temp	454.9 K (359.1°F) at 9930 s
Comments	None.

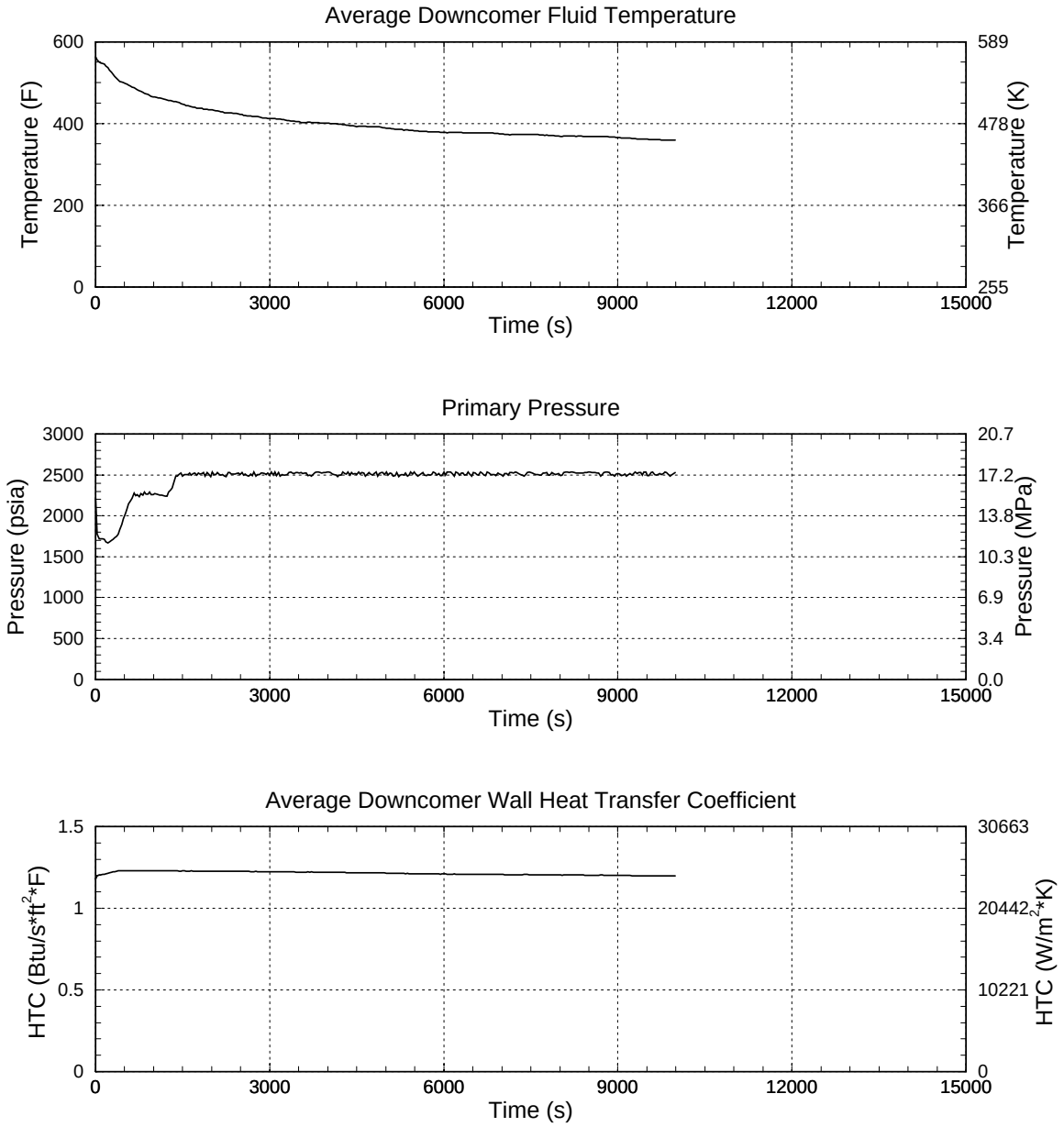


Figure A.2-33: Oconee PTS Results for Case 028

Case Category	TT/RT
Primary Failures	None
Secondary Failures	1 stuck open safety valve in SG-A and a second stuck open safety valve in SG-B
Operator Actions	None
Min DC Temp	430.4 K (315.1°F) at 9900 s
Comments	None.

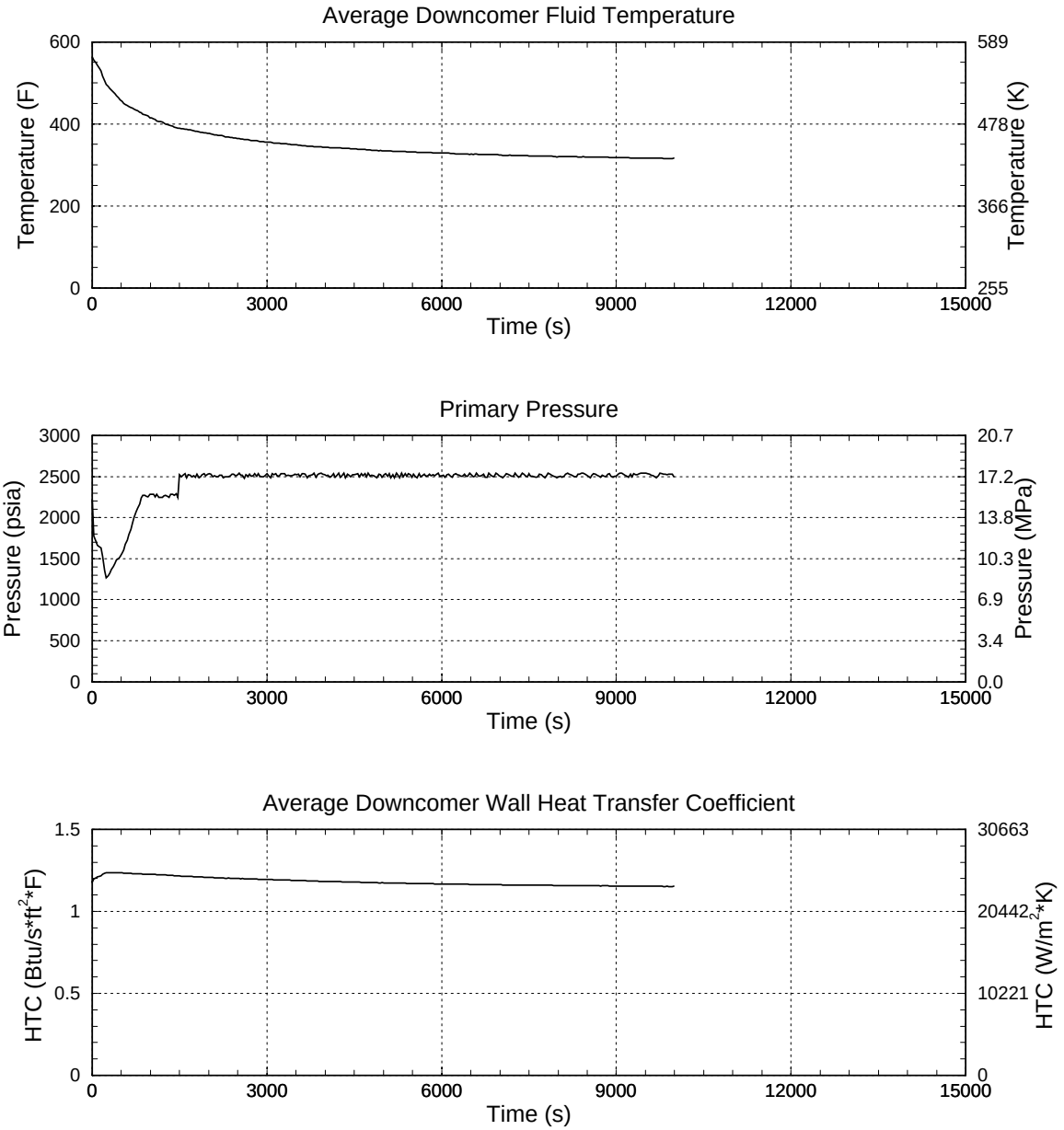


Figure A.2-34: Oconee PTS Results for Case 029

Case Category	TT/RT - HZP
Primary Failures	None
Secondary Failures	1 stuck open safety valve in SG-A
Operator Actions	None
Min DC Temp	435.1 K (323.4°F) at 9990 s
Comments	None.

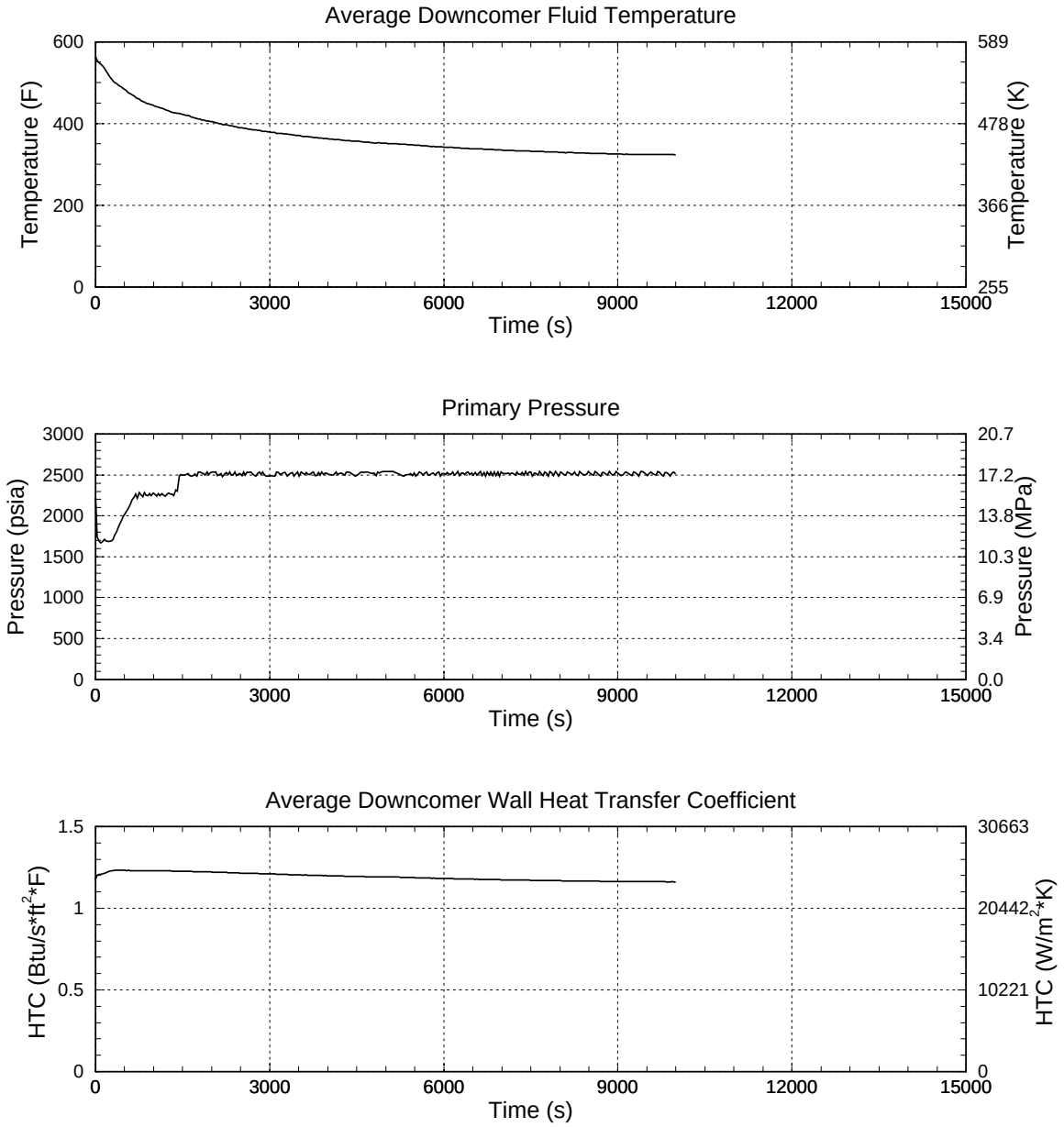


Figure A.2-35: Oconee PTS Results for Case 030

Case Category	TT/RT - HZP
Primary Failures	None
Secondary Failures	1 stuck open safety valve in SG-A and a second stuck open safety valve in SG-B
Operator Actions	None
Min DC Temp	409.5 K (277.4°F) at 14910 s
Comments	None.

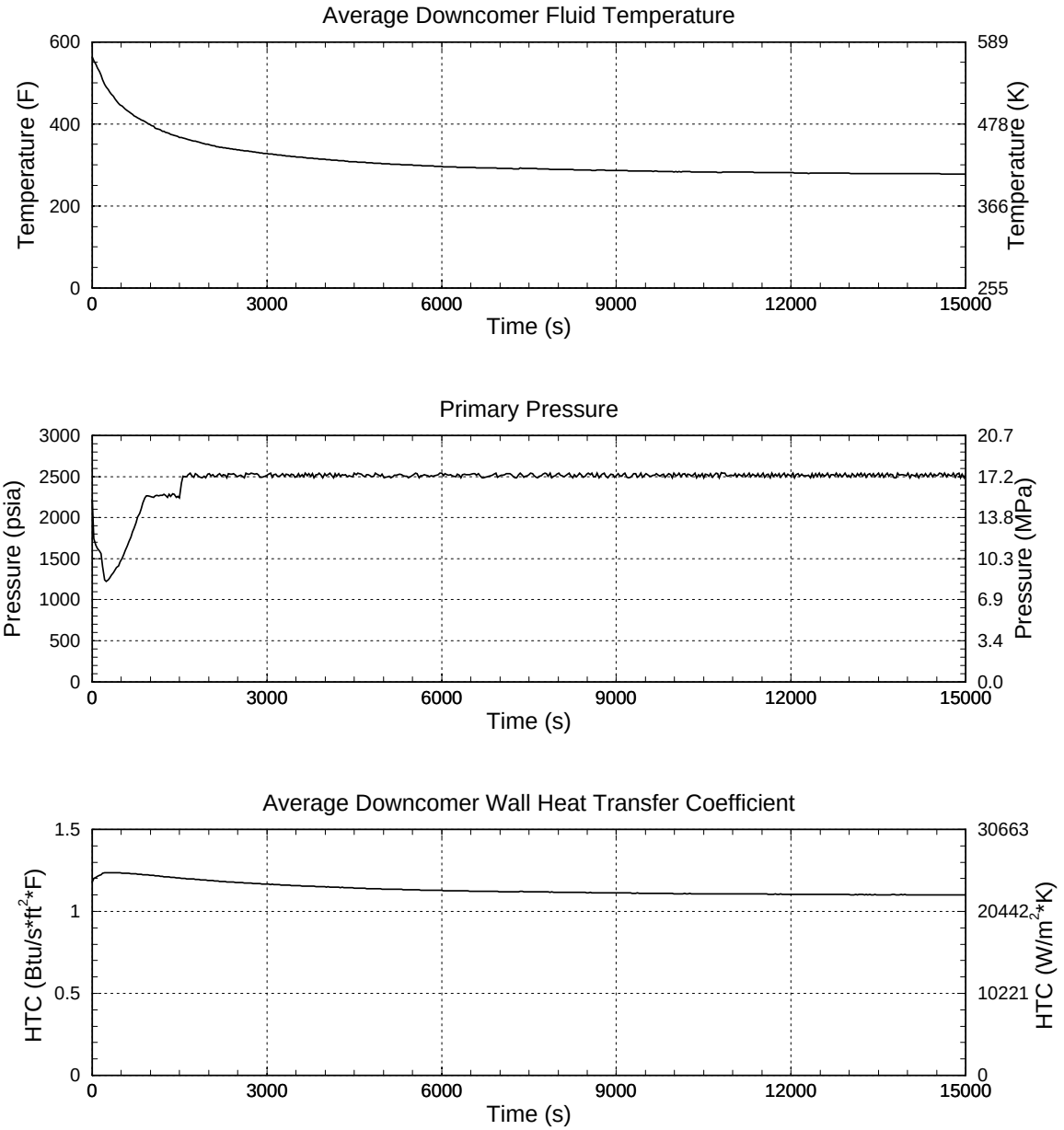


Figure A.2-36: Oconee PTS Results for Case 031

Case Category	TT/RT
Primary Failures	None
Secondary Failures	SG level control system failure causes SG overfill. MFW continues running and the SGs flood.
Operator Actions	Operator trips MFW when water enters the steam lines. Operator also throttles HPI (throttling criteria is 27.8 K (50°F) subcooling and 300 cm (120 in) pressurizer level)
Min DC Temp	554.2 K (537.9°F) at 300 s
Comments	None.

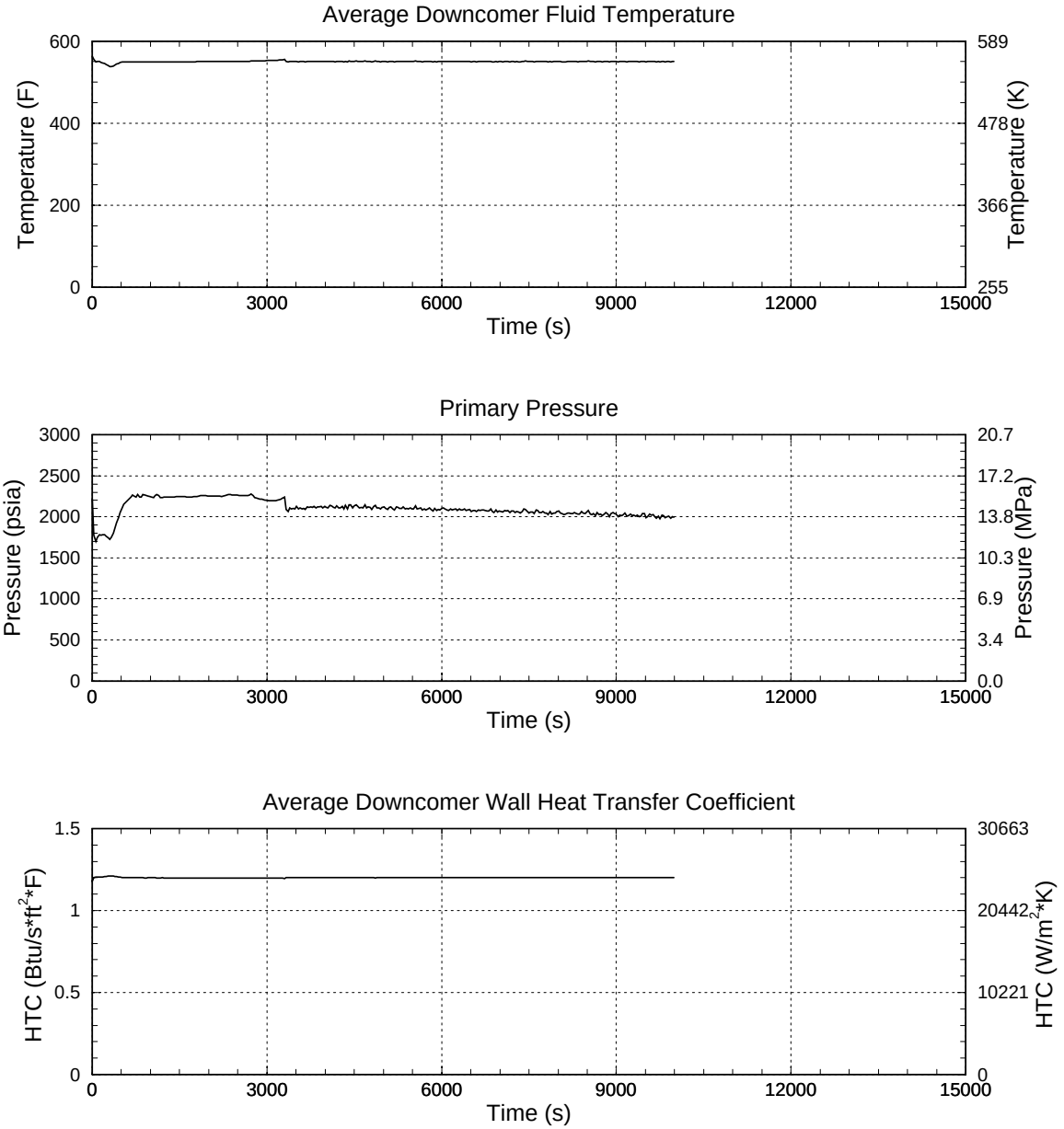


Figure A.2-37: Oconee PTS Results for Case 032

Case Category	TT/RT
Primary Failures	None
Secondary Failures	One stuck open TBV in SG-A. Valve recloses in 10 minutes.
Operator Actions	Operator throttles HPI to maintain a level of 559 cm (220 in) in the pressurizer
Min DC Temp	530.0 K (494.4°F) at 600 s
Comments	None.

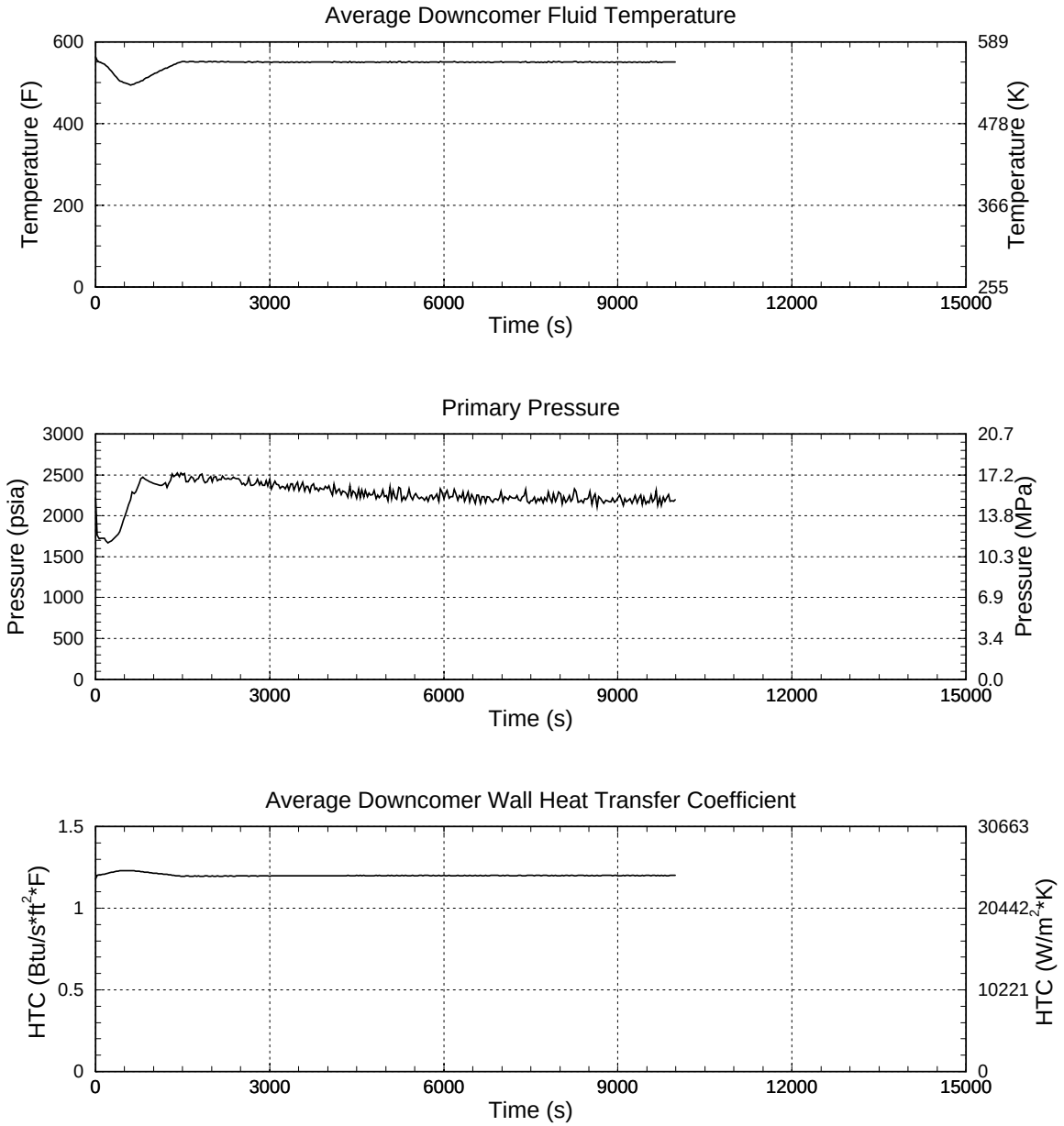


Figure A.2-38: Oconee PTS Results for Case 033

Case Category	TT/RT
Primary Failures	Stuck open pressurizer safety valve
Secondary Failures	None
Operator Actions	None
Min DC Temp	306.0 K (91.2°F) at 11100 s
Comments	None.

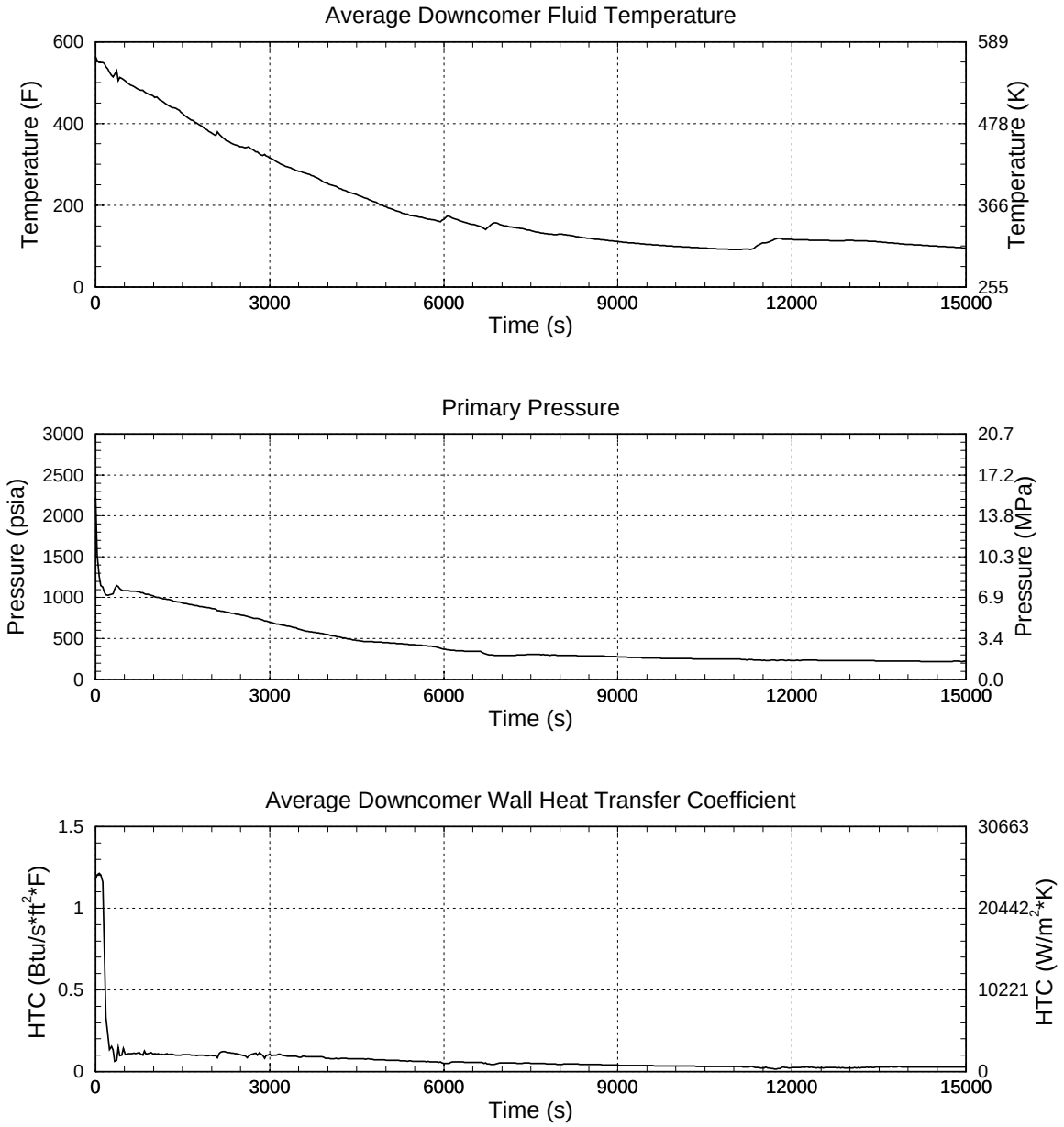
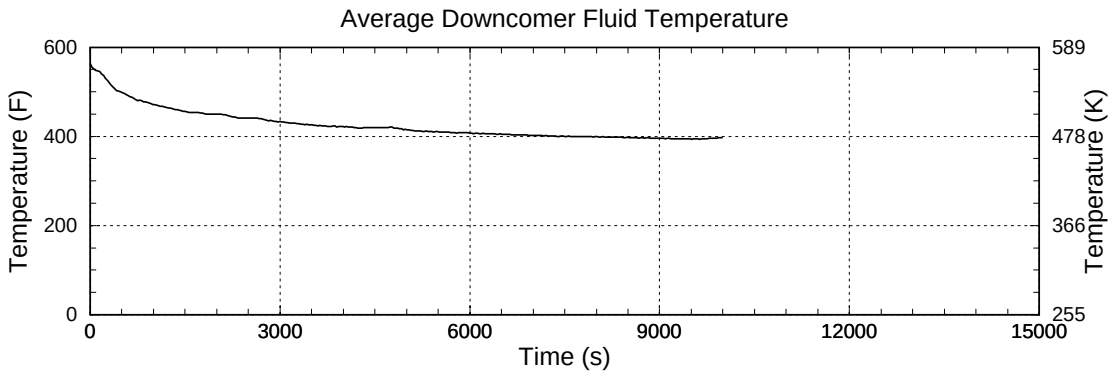
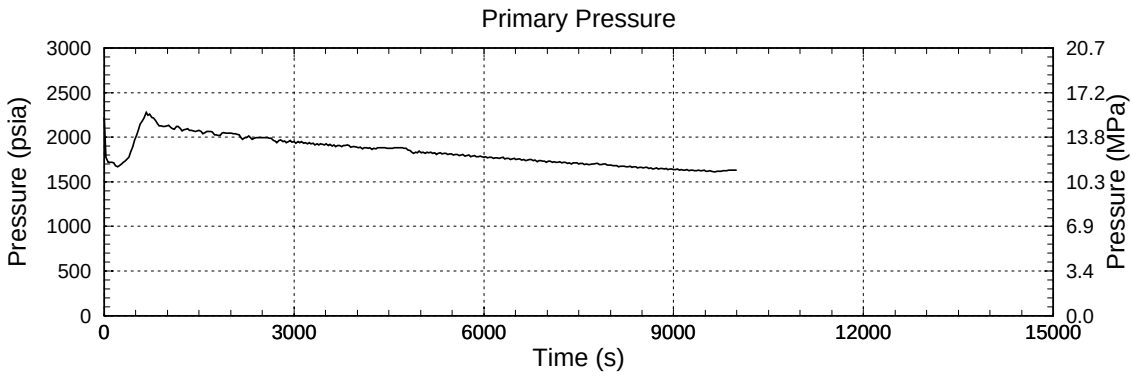


Figure A.2-39: Oconee PTS Results for Case 034

Case Category	TT/RT
Primary Failures	None
Secondary Failures	1 stuck open safety valve in SG-A
Operator Actions	Operator throttles HPI to maintain 27.8 K (50°F) subcooling and 304.8 cm (120 in) pressurizer level.
Min DC Temp	474.2 K (393.9°F) at 9630 s
Comments	None.





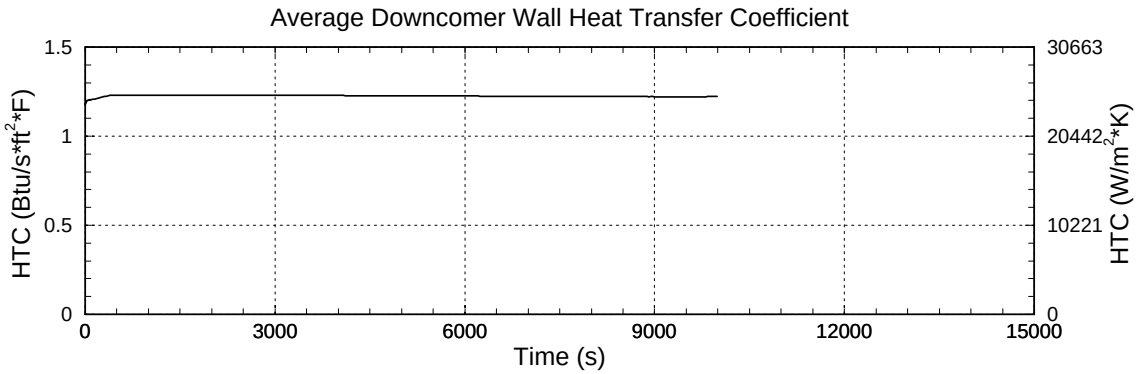


Figure A.2-40: Oconee PTS Results for Case 035

Case Category	TT/RT
Primary Failures	None
Secondary Failures	1 stuck open safety valve in SG-A and a second stuck open safety valve in SG-B
Operator Actions	Operator throttles HPI to maintain 27.8 K (50°F) subcooling and 304.8 cm (120 in) pressurizer level.
Min DC Temp	443.5 K (338.7°F) at 9990 s
Comments	None.

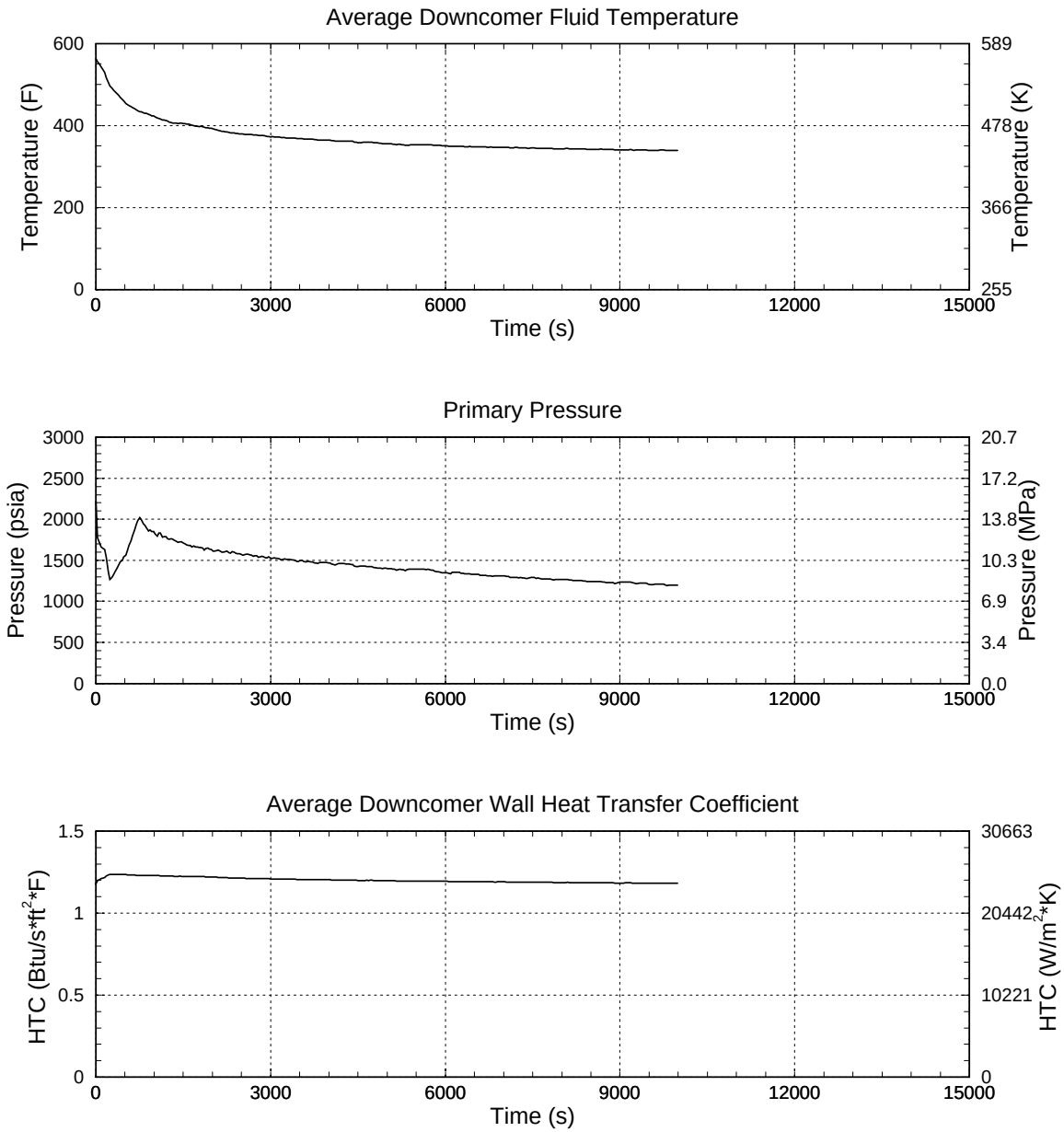


Figure A.2-41: Oconee PTS Results for Case 036

Case Category	TT/RT - HZP
Primary Failures	None
Secondary Failures	1 stuck open safety valve in SG-A
Operator Actions	Operator throttles HPI to maintain 27.8 K (50°F) subcooling and 304.8 cm (120 in) pressurizer level.
Min DC Temp	458.0 K (364.8°F) at 9030 s
Comments	None.

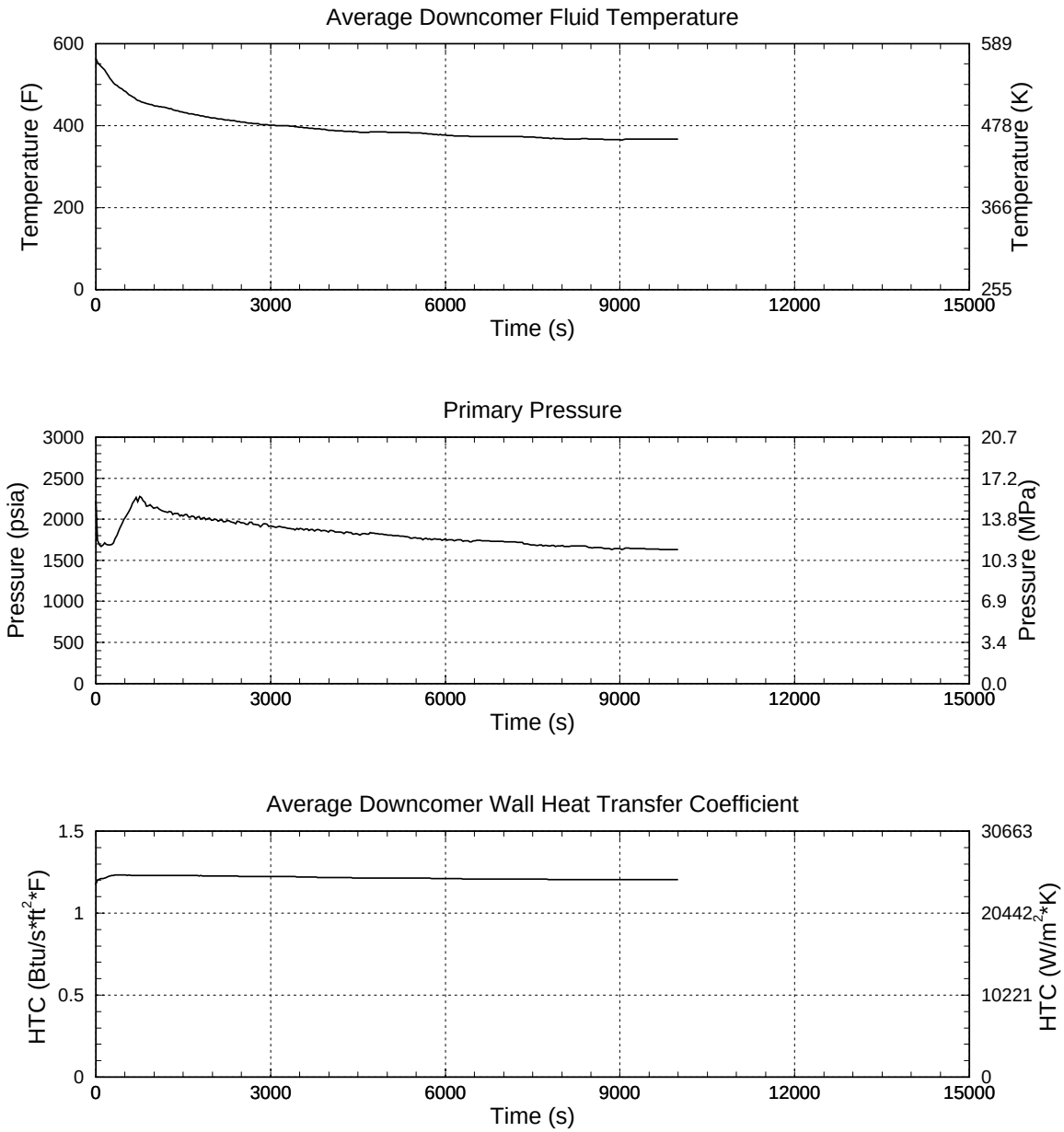


Figure A.2-42: Oconee PTS Results for Case 037

Case Category	TT/RT-HZP
Primary Failures	None
Secondary Failures	1 stuck open safety valve in SG-A and a second stuck open safety valve in SG-B
Operator Actions	Operator throttles HPI to maintain 27.8 K (50°F) subcooling and 304.8 cm (120 in) pressurizer level.
Min DC Temp	428.6 K (311.8°F) at 9930 s
Comments	None.

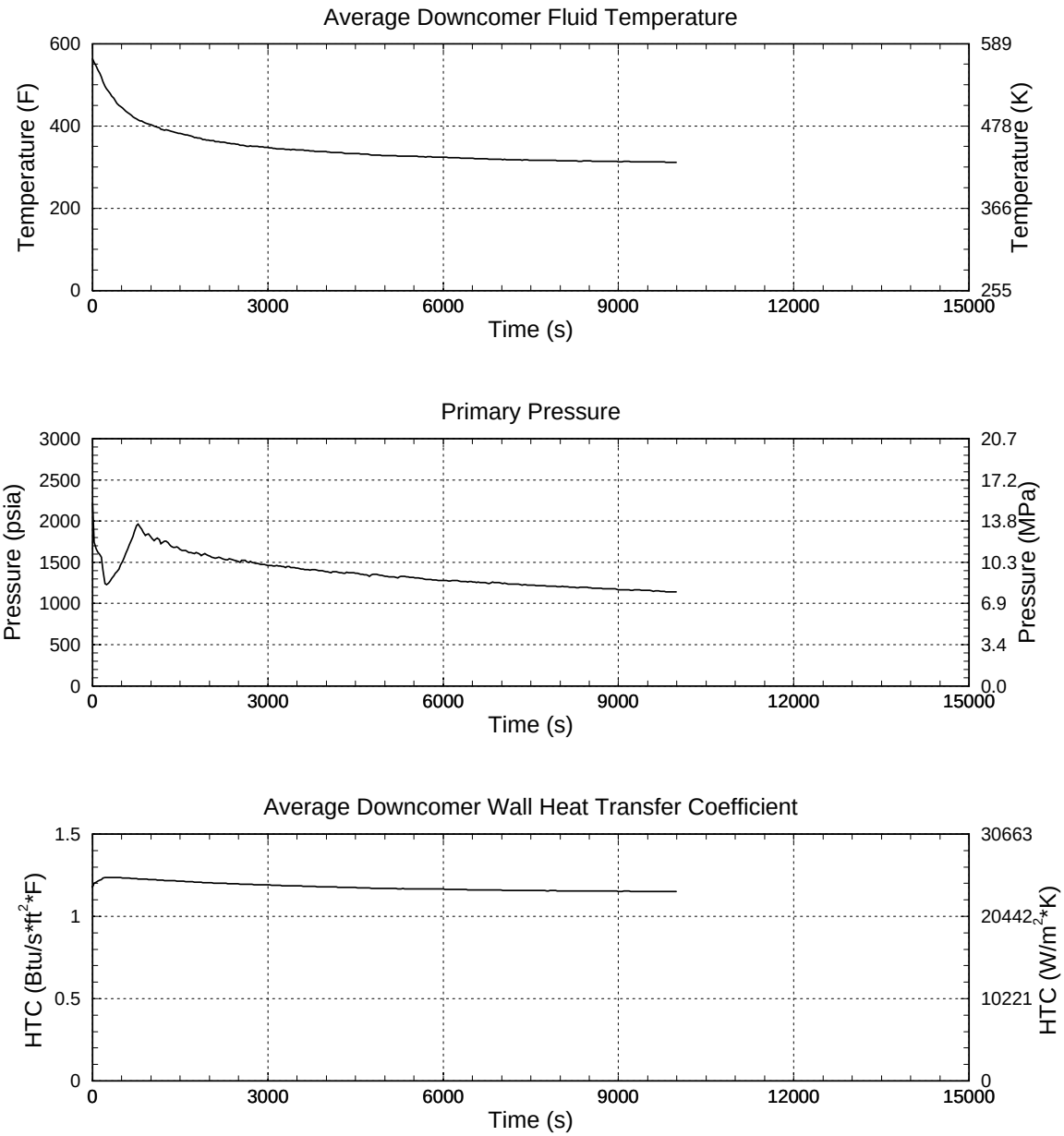


Figure A.2-43: Oconee PTS Results for Case 038

Case Category	SGTR
Primary Failures	None
Secondary Failures	SGTR with a stuck open SRV in SG-A. A reactor trip is assumed to occur at the time of the tube rupture.
Operator Actions	None.
Min DC Temp	459.3 K (367.0°F) at 9990 s
Comments	None.

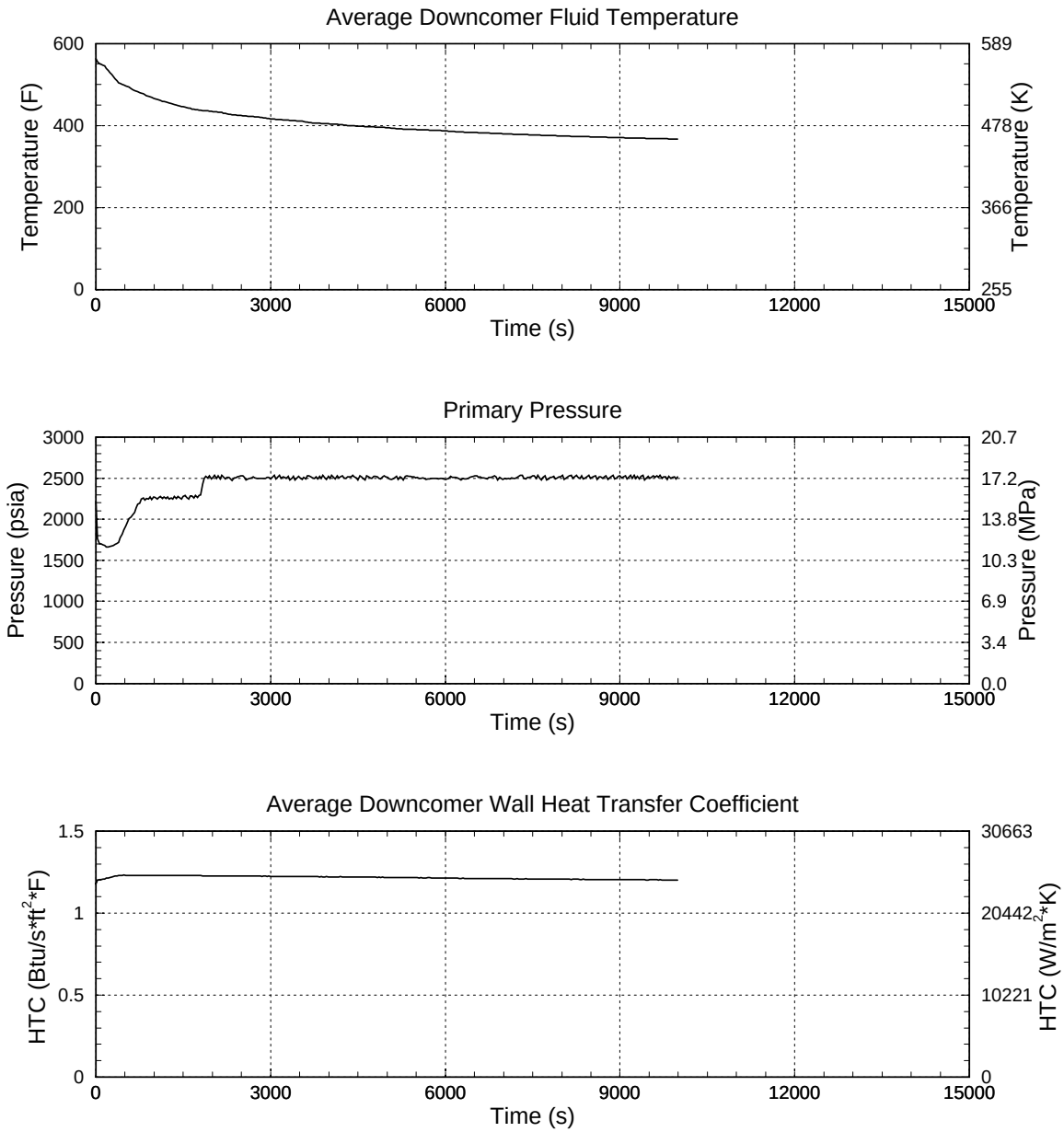


Figure A.2-44: Oconee PTS Results for Case 039

Case Category	SGTR
Primary Failures	SGTR with PORV stuck open.
Secondary Failures	A reactor trip is assumed to occur at the time of the tube rupture.
Operator Actions	0
Min DC Temp	560.2 K (548.8°F) at 7890 s
Comments	None.

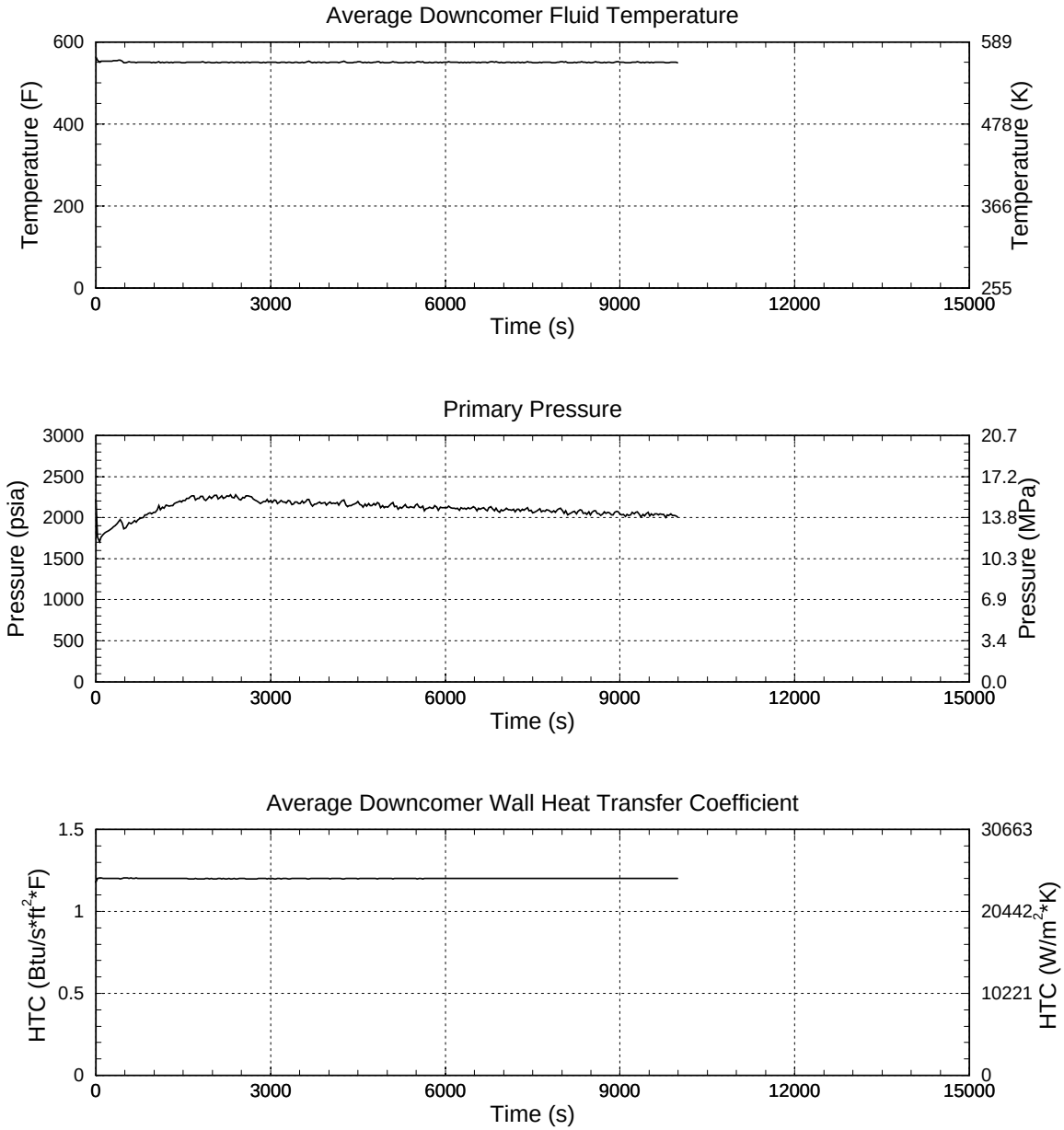


Figure A.2-45: Oconee PTS Results for Case 040

Case Category	TT/RT
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 6000 secs (RCS low pressure point).
Secondary Failures	None
Operator Actions	None
Min DC Temp	344.3 K (160.0°F) at 5940 s
Comments	None.

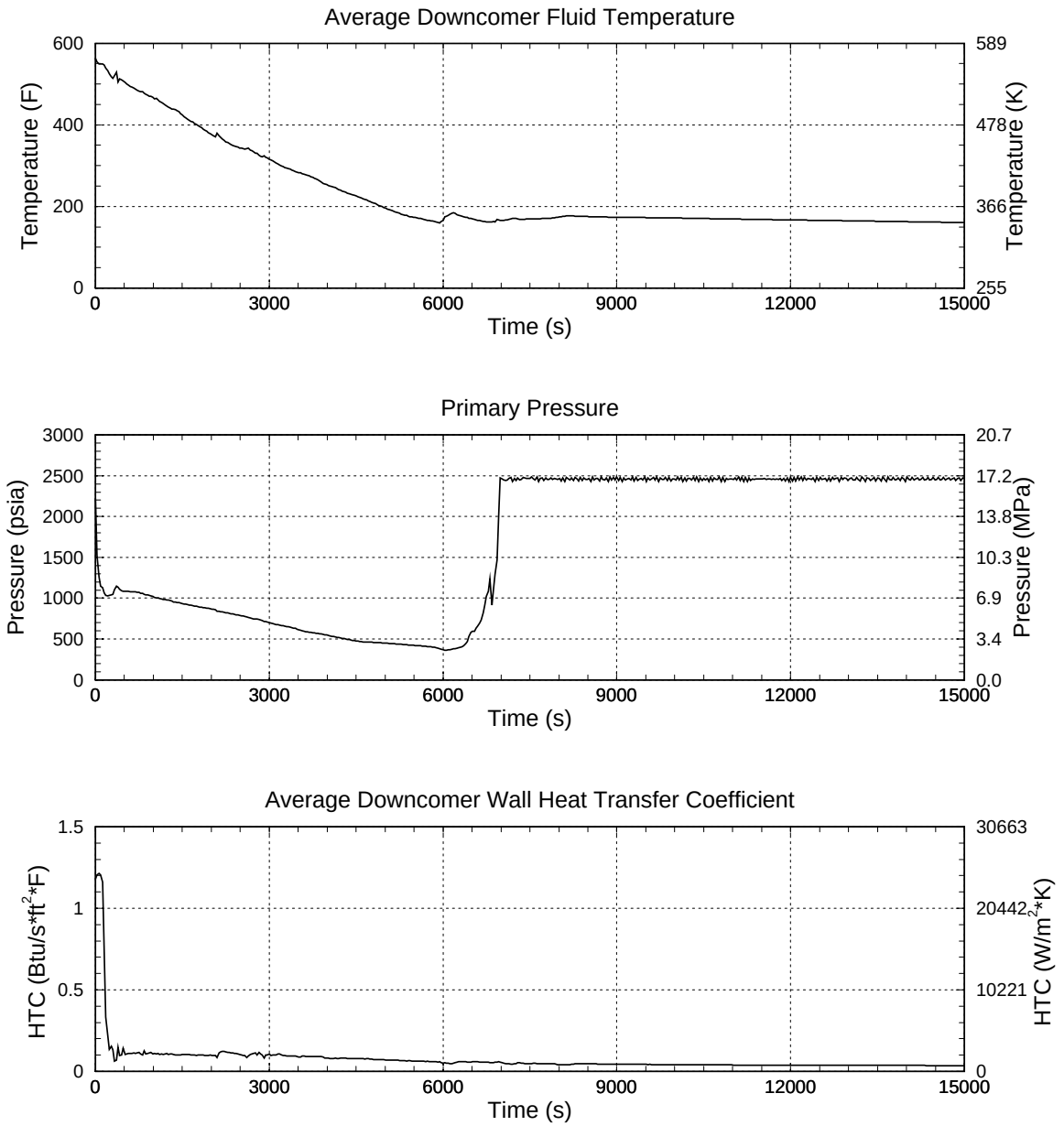


Figure A.2-46: Oconee PTS Results for Case 041

Case Category	TT/RT - HZP
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 6000 secs.
Secondary Failures	None
Operator Actions	None
Min DC Temp	313.9 K (105.4°F) at 15000 s
Comments	None.

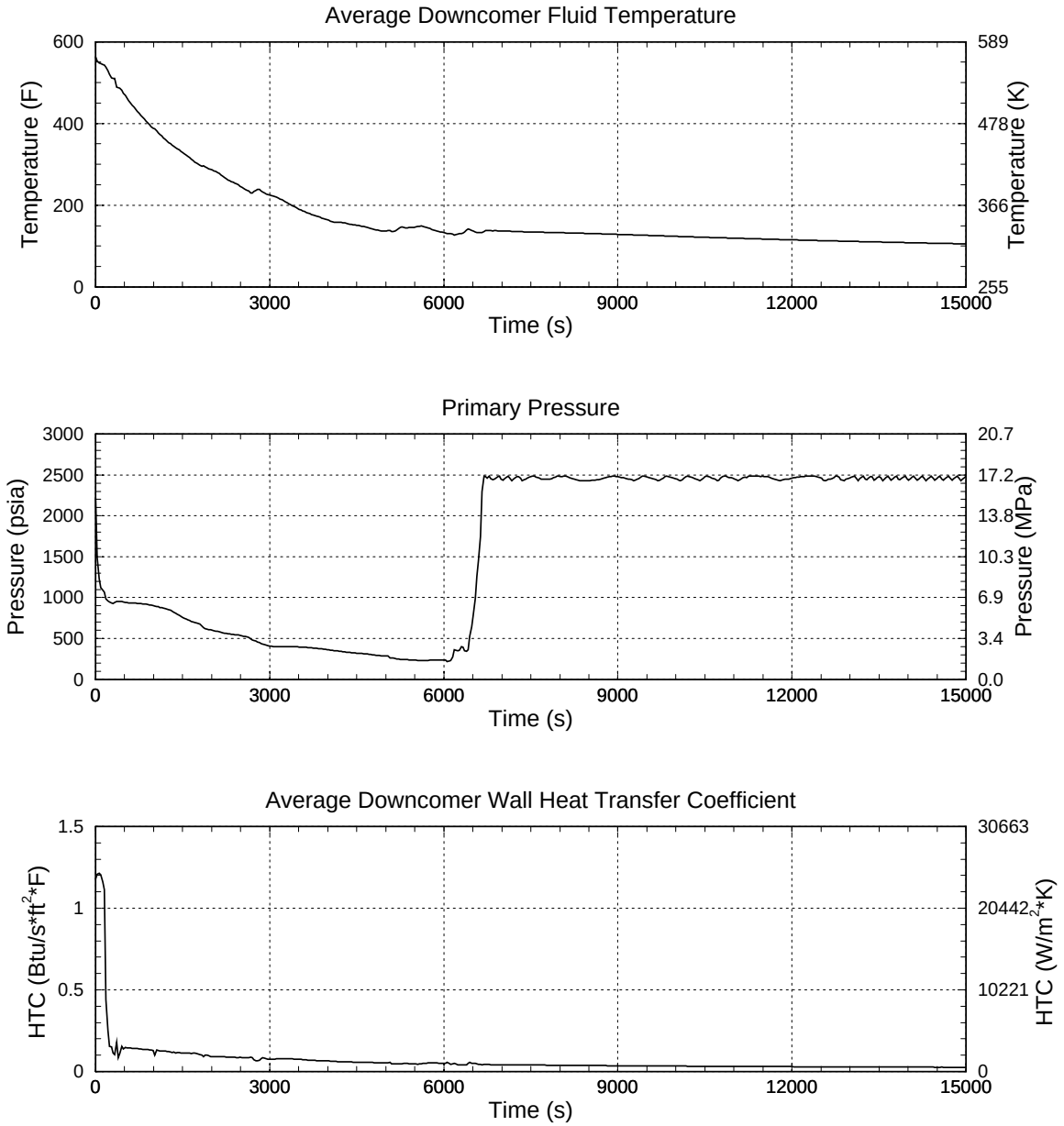


Figure A.2-47: Oconee PTS Results for Case 042

Case Category	TT/RT
Primary Failures	Stuck open PORV. Valve recloses at 400 sec (RCS low pressure point)
Secondary Failures	None
Operator Actions	None
Min DC Temp	559.8 K (547.9°F) at 13470 s
Comments	None.

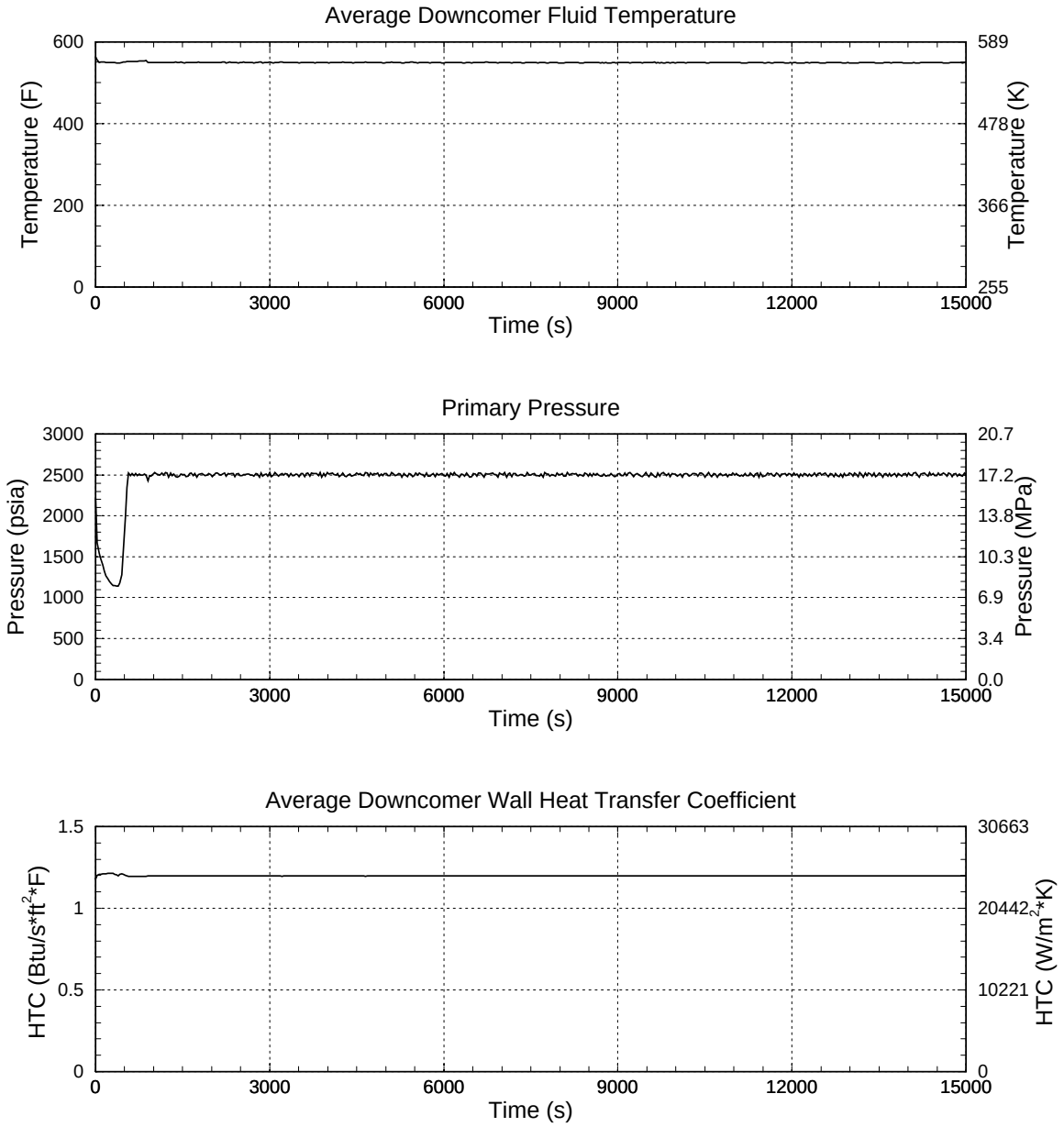


Figure A.2-48: Oconee PTS Results for Case 043

Case Category	LOCA
Primary Failures	2.54 cm (1 in) surge line break with HPI Failure
Secondary Failures	None.
Operator Actions	At 15 minutes after initiation, operators open all TBVs to depressurize the system to the CFT setpoint. When the CFTs are 50% discharged, HPI is assumed to be recovered. The TBVs are assumed remain open for the duration of the transient.
Min DC Temp	361.9 K (191.7°F) at 2940 s
Comments	None.

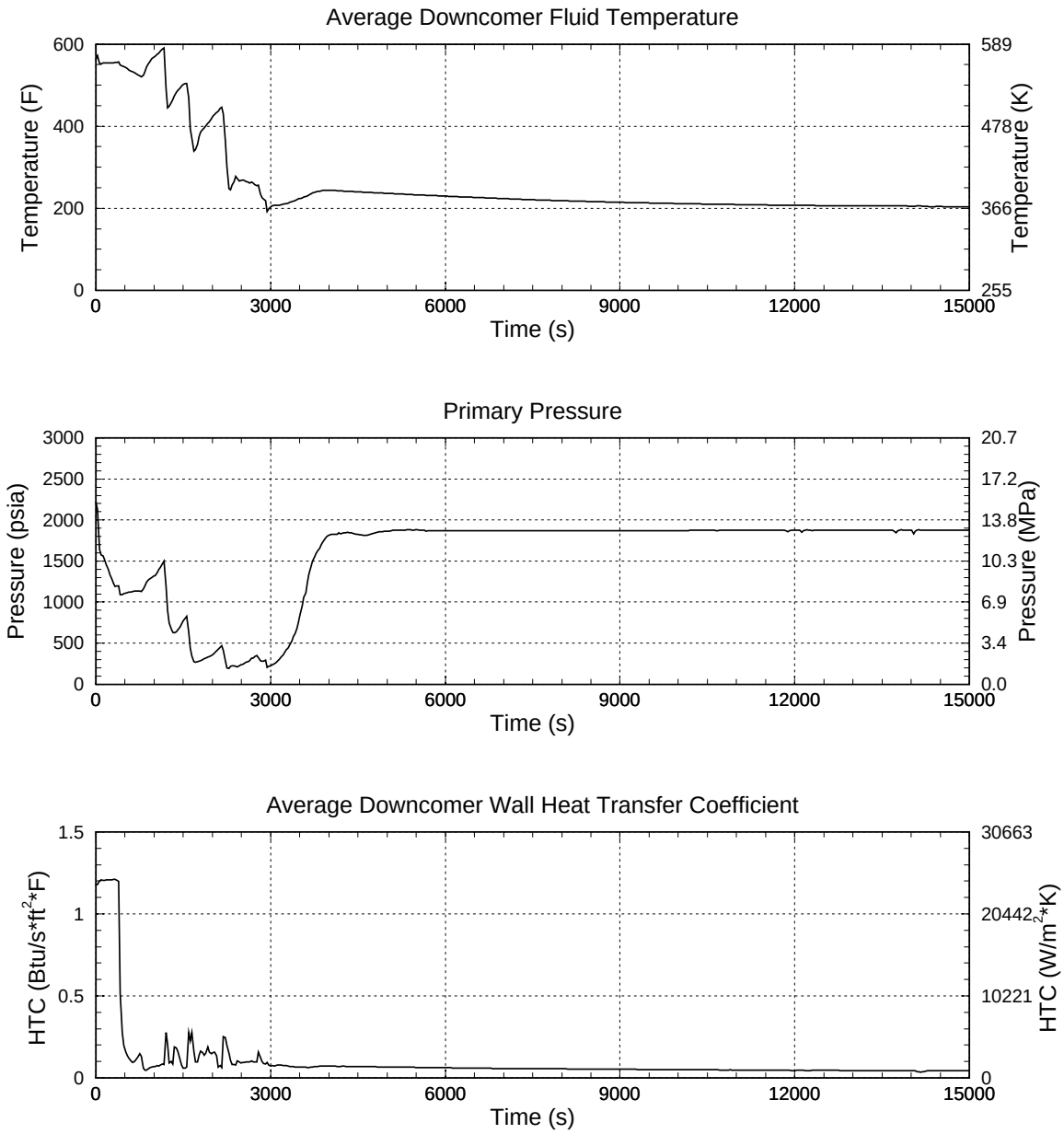


Figure A.2-49: Oconee PTS Results for Case 044

Case Category	TT/RT
Primary Failures	None
Secondary Failures	Loss of MFW and EFW. At 30 minutes after operator starts HPI and opens the PORV, EFW is restored. Normal EFW level control is assumed.
Operator Actions	Operator starts primary system "feed and bleed" cooling by starting the HPI and opening the PORV at RCS pressure > 2275 psia. Operator also trips one RCP in each SG loop (if 0.27 K (0.5°F) subcooling margin is reached, the remaining two RCPs are tripped). The operator then closes the PORV and throttles HPI to maintain 55 K (100°F) subcooling.
Min DC Temp	556.7 K (542.5°F) at 2160 s
Comments	None.

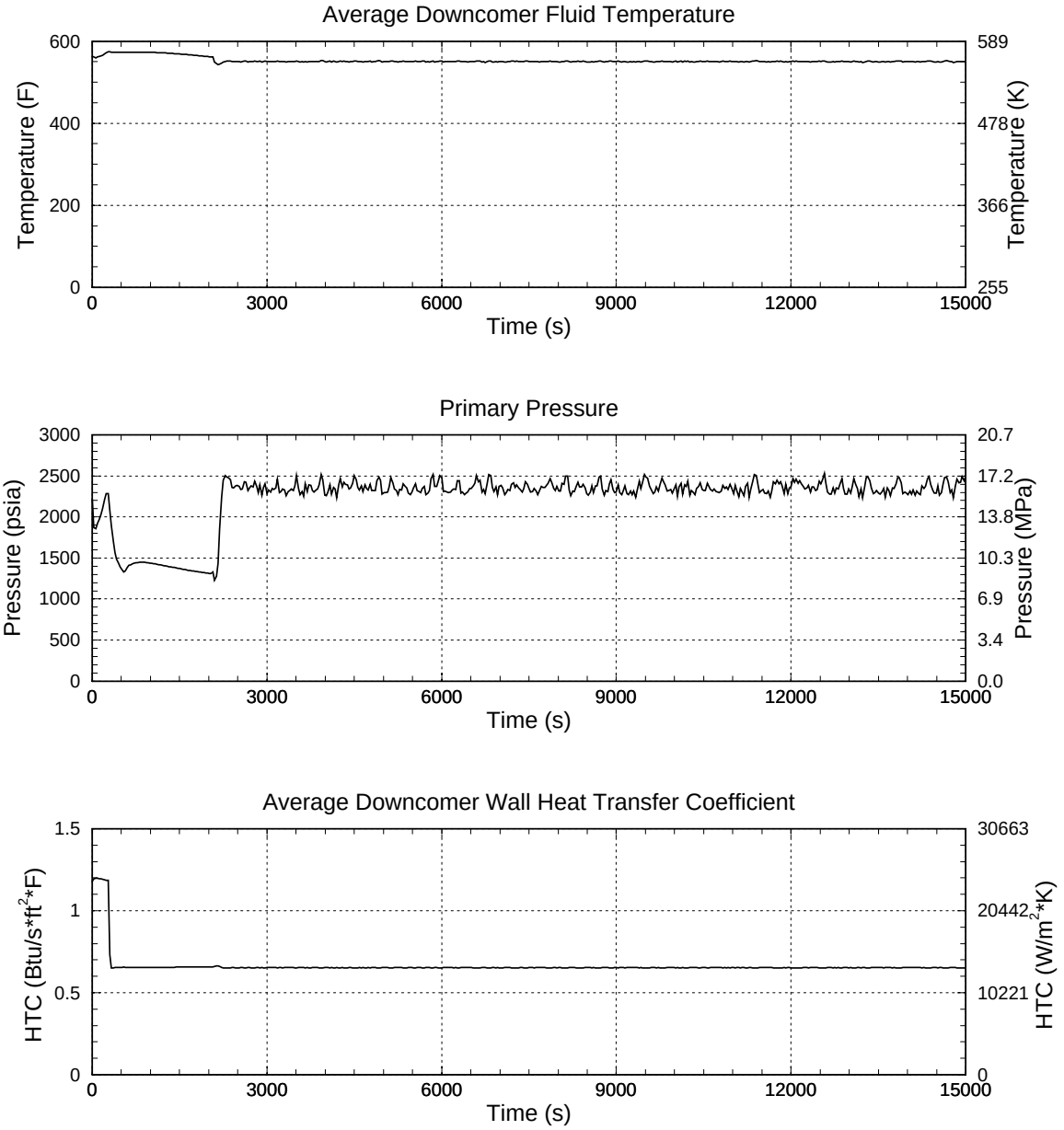


Figure A.2-50: Oconee PTS Results for Case 045

Case Category	TT/RT
Primary Failures	None
Secondary Failures	Loss of MFW and EFW. At 30 minutes after operator starts HPI and opens the PORV, EFW is restored. Normal EFW level control is assumed.
Operator Actions	Operator starts primary system "feed and bleed" cooling by starting the HPI and opening the PORV at RCS pressure > 2275 psia. Operator also trips one RCP in each SG loop (if 0.27 K (0.5°F) subcooling margin is reached, the remaining two RCPs are tripped). The operator then closes the PORV but fails to throttle HPI.
Min DC Temp	556.9 K (542.7°F) at 2160 s
Comments	None.

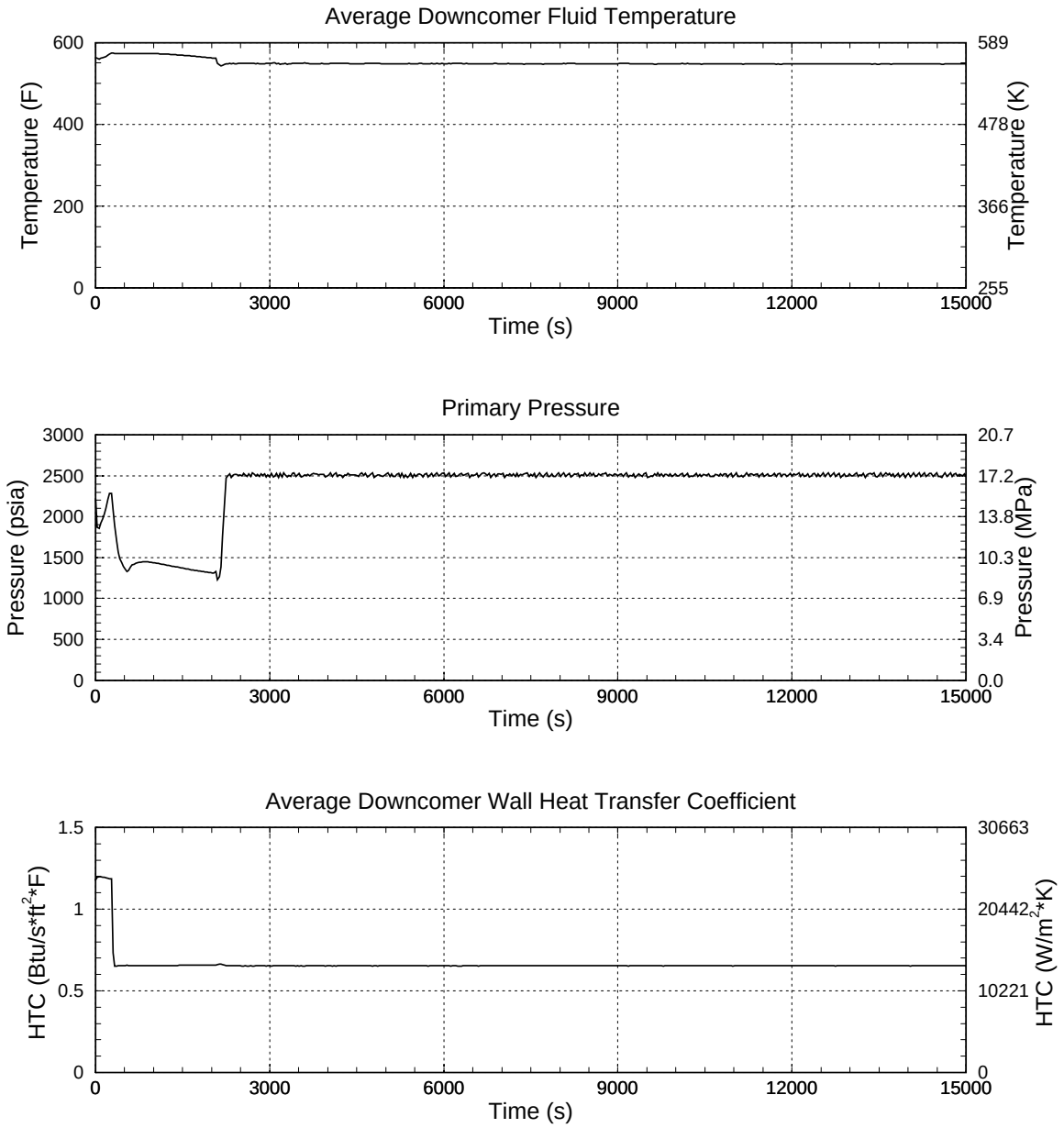


Figure A.2-51: Oconee PTS Results for Case 046

Case Category	TT/RT
Primary Failures	None
Secondary Failures	Loss of MFW and EFW. At 30 minutes after operator starts HPI and opens the PORV, EFW is restored. EFW level control fails where the SGs are overfilled and remain overfilled but water does not enter the steam lines.
Operator Actions	Operator starts primary system "feed and bleed" cooling by starting the HPI and opening the PORV at RCS pressure > 2275 psia. Operator also trips one RCP in each SG loop (if 0.27 K (0.5°F) subcooling margin is reached, the remaining two RCPs are tripped).
Min DC Temp	537.5 K (507.9°F) at 930 s
Comments	None.

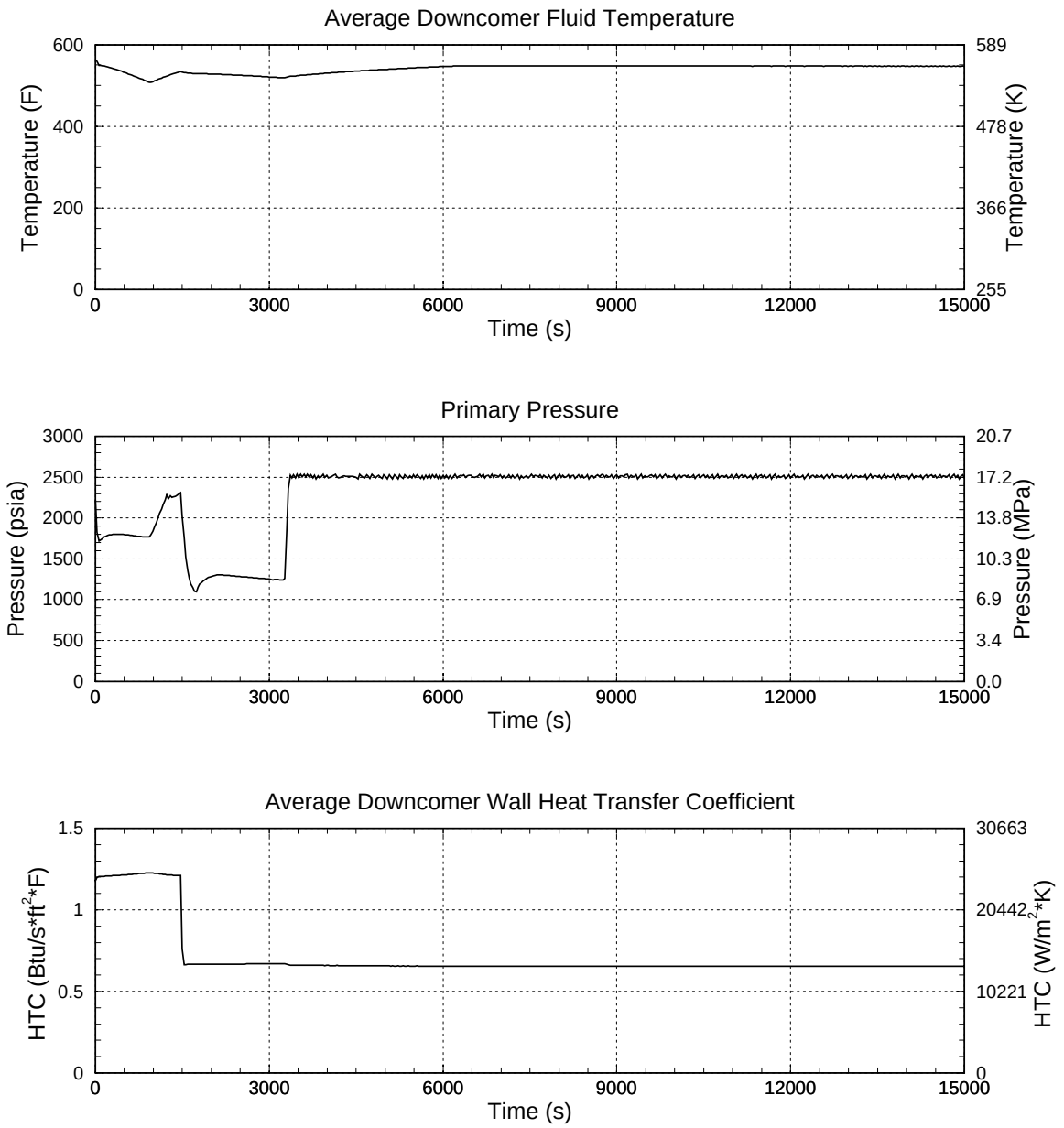


Figure A.2-52: Oconee PTS Results for Case 047

Case Category	TT/RT
Primary Failures	None
Secondary Failures	Loss of MFW and EFW. At 30 minutes after operator starts HPI and opens the PORV, EFW is restored. Normal EFW level control is assumed.
Operator Actions	Operator starts primary system "feed and bleed" cooling by starting the HPI and opening the PORV at RCS pressure > 2275 psia. Operator also trips one RCP in each SG loop when 2.7 K (5°F) subcooling margin is reached, the remaining two RCPs are tripped). The operator then closes the PORV and throttles HPI to maintain 55 K (100°F) subcooling.
Min DC Temp	507.0 K (453.0°F) at 2130 s
Comments	None.

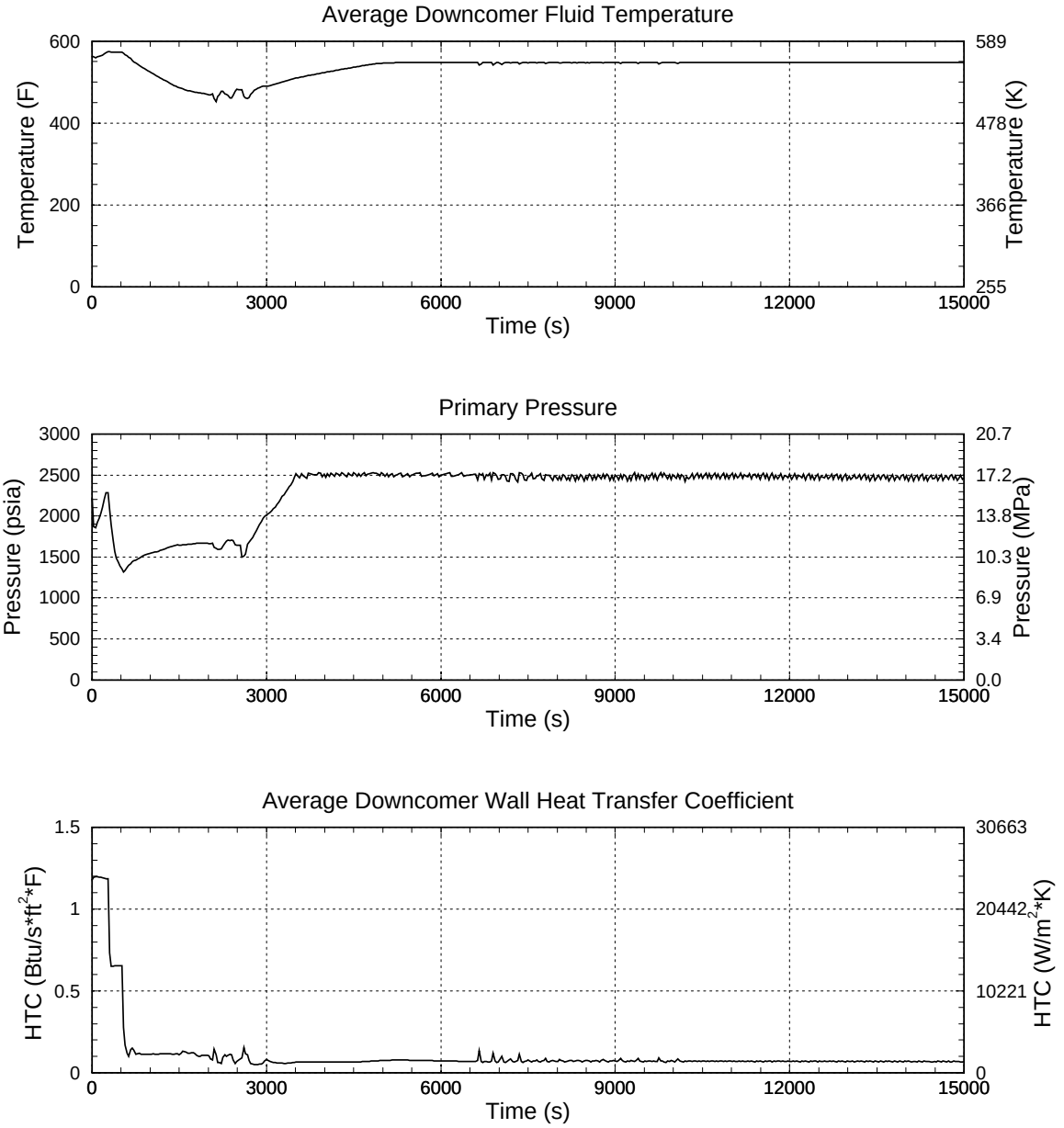


Figure A.2-53: Oconee PTS Results for Case 048

Case Category	TT/RT
Primary Failures	None
Secondary Failures	Loss of MFW and EFW.
Operator Actions	Opens the TBV to depressurize the secondary side so that the condensate booster pumps feed the SGs. Booster pumps are assumed to be uncontrolled so that the SGs are overfilled. Booster pump flow is then assumed to be terminated. Operator throttles HPI to maintain 55 K (100°F) subcooling and a pressurizer level of 254 cm (100 in). The operator also throttles the TBVs to maintain 3.45 MPa (500 psi) secondary side pressure.
Min DC Temp	515.5 K (468.2°F) at 840 s
Comments	None.

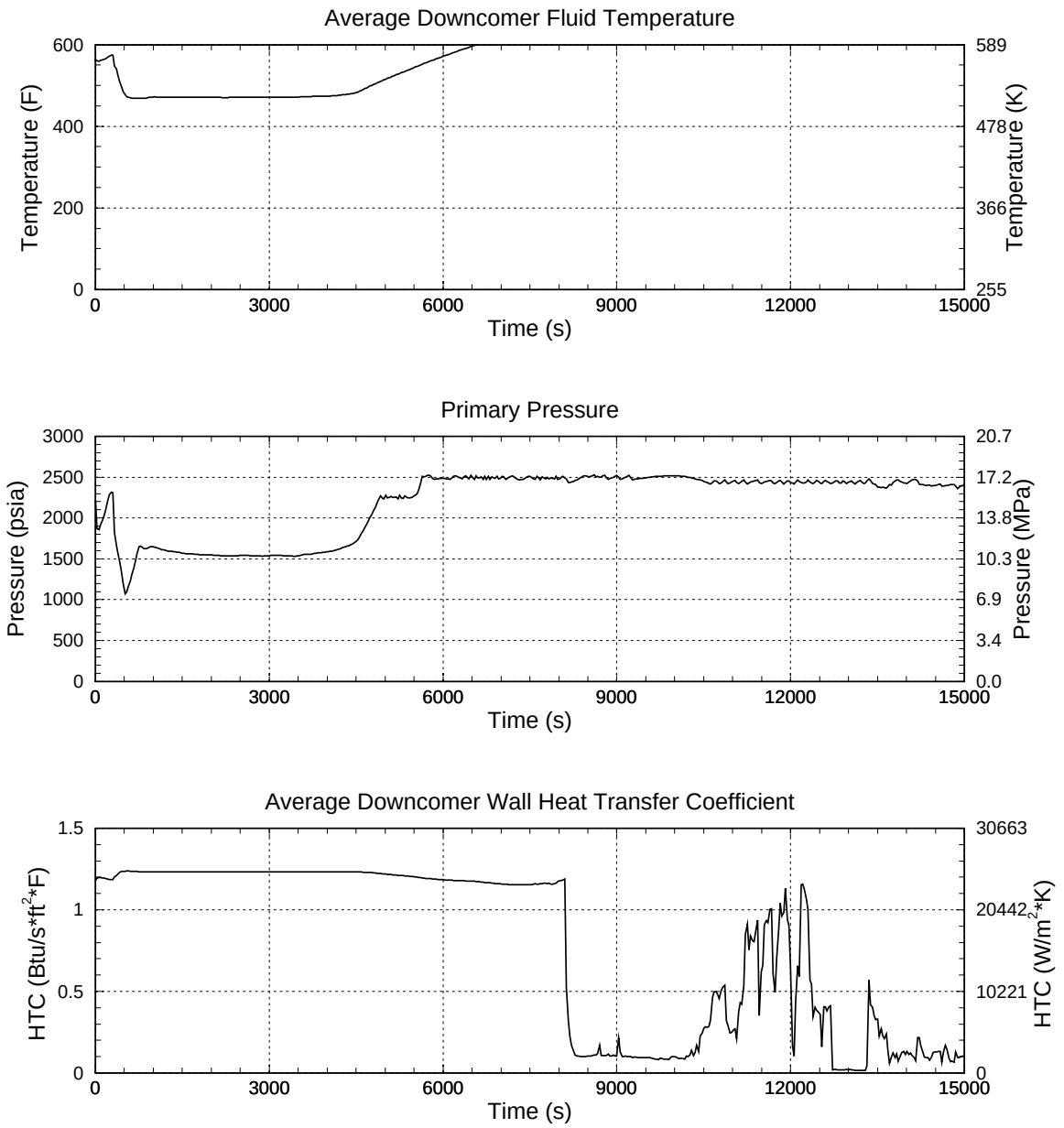


Figure A.2-54: Oconee PTS Results for Case 049

Case Category	TT/RT
Primary Failures	None
Secondary Failures	Loss of MFW and EFW.
Operator Actions	Operator opens all TBVs to depressurize the secondary side so that the condensate booster pumps feed the SGs. Booster pumps are assumed to be uncontrolled so that the SGs are filled to the top. Booster pump flow is then assumed to be terminated. Operator throttles HPI to maintain 55 K (100°F) subcooling and a pressurizer level of 254 cm (100 in). The TBVs are kept fully opened due to operator error.
Min DC Temp	440.6 K (333.4°F) at 2850 s
Comments	None.

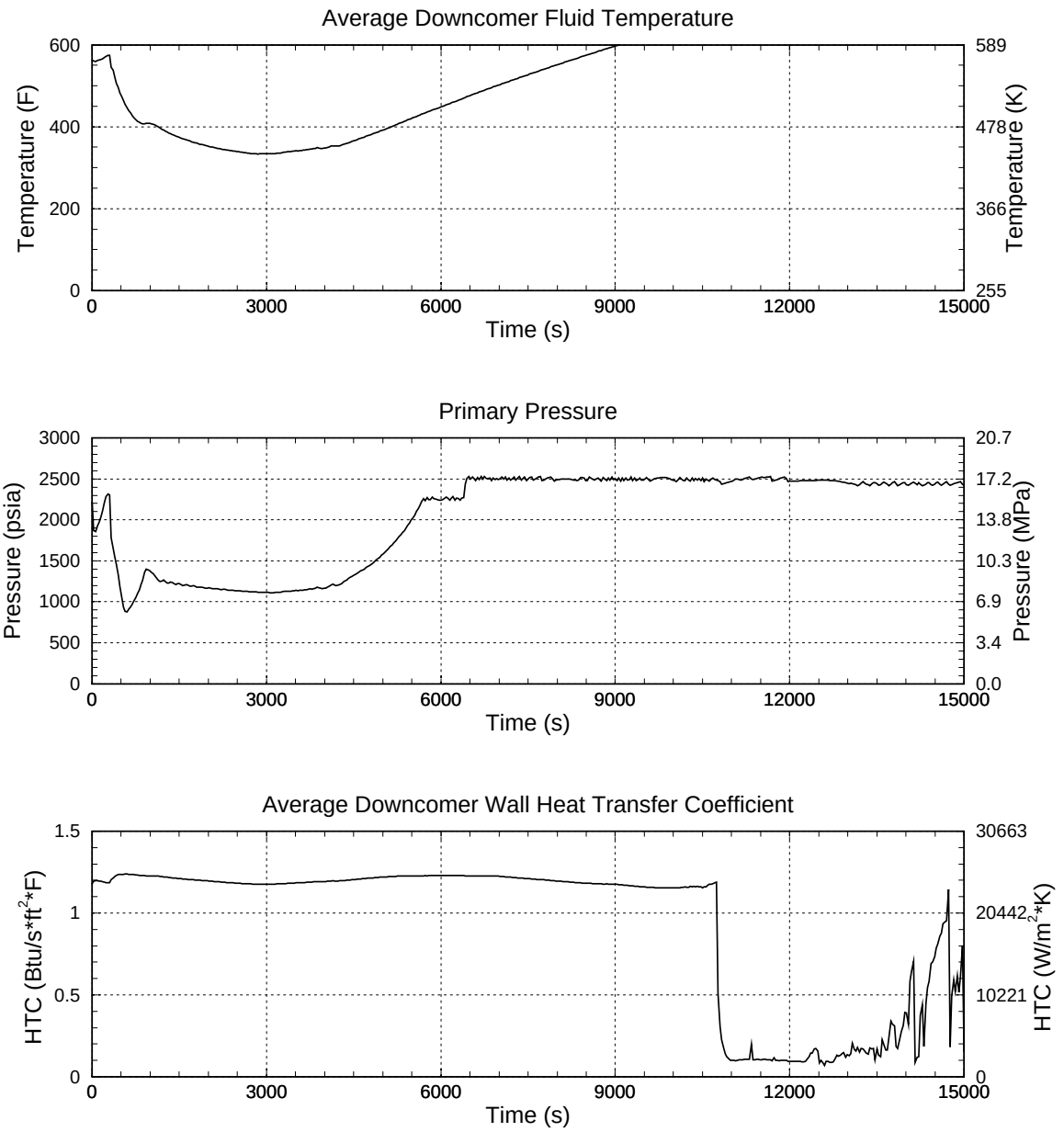


Figure A.2-55: Oconee PTS Results for Case 050

Case Category	TT/RT - HZP
Primary Failures	None
Secondary Failures	Loss of MFW and EFW.
Operator Actions	Opens the TBVs to depressurize the secondary side so that the condensate booster pumps feed the SGs. Booster pumps are assumed to be uncontrolled so that the SGs are filled to the top. Booster pump flow is then assumed to be terminated. Operator throttles HPI to maintain 55 K (100°F) subcooling and a pressurizer level of 254 cm (100 in). The operator throttles the TBVs to maintain 500 psi secondary side pressure.
Min DC Temp	513.6 K (464.9°F) at 1140 s
Comments	None.

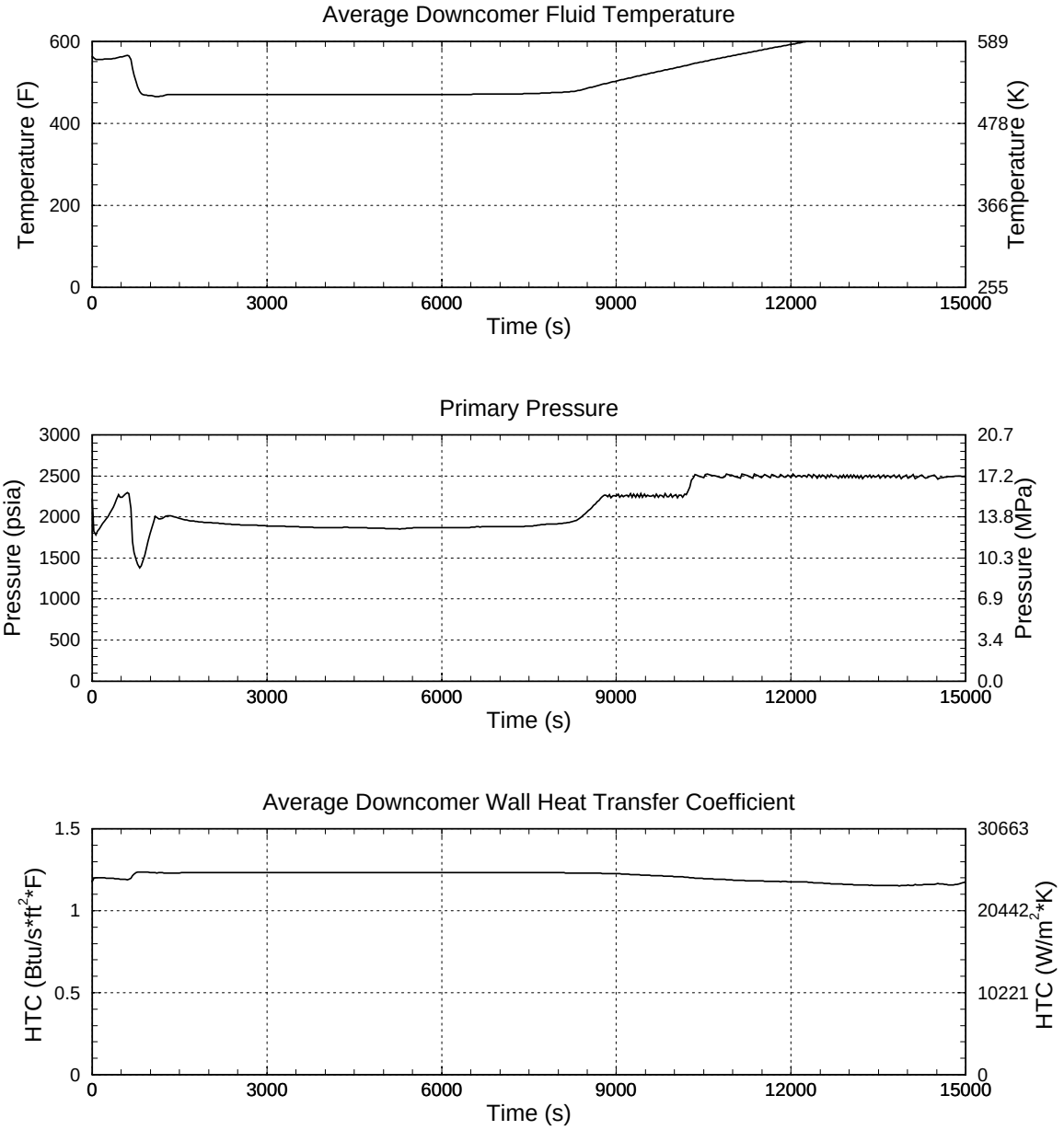


Figure A.2-56: Oconee PTS Results for Case 051

Case Category	LOCA
Primary Failures	14.37 cm (5.656 in) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	294.6 K (70.6°F) at 14970 s
Comments	None.

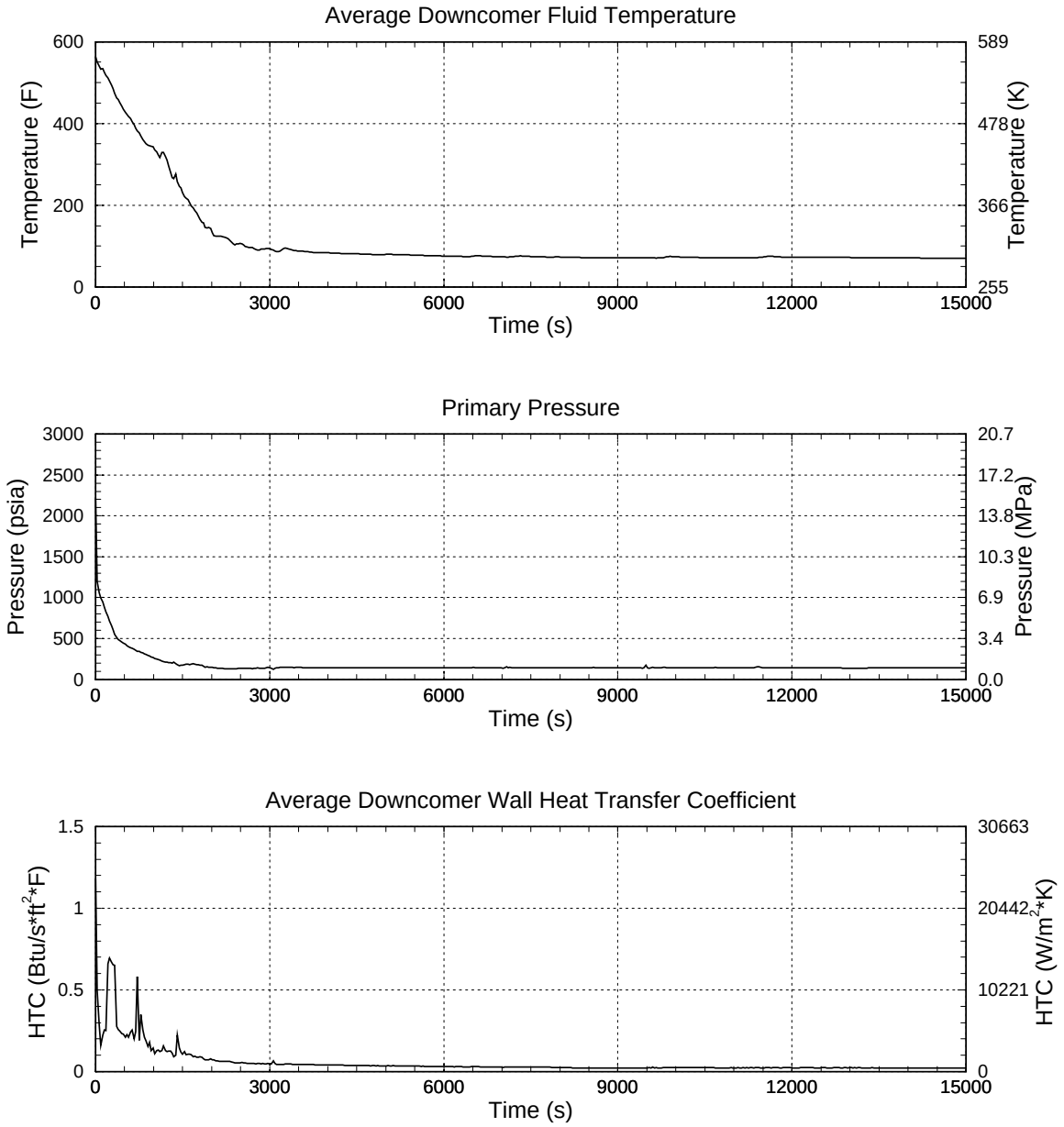


Figure A.2-57: Oconee PTS Results for Case 052

Case Category	LOCA
Primary Failures	20.32 cm (8 inch) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	294.3 K (70.1°F) at 13560 s
Comments	None.

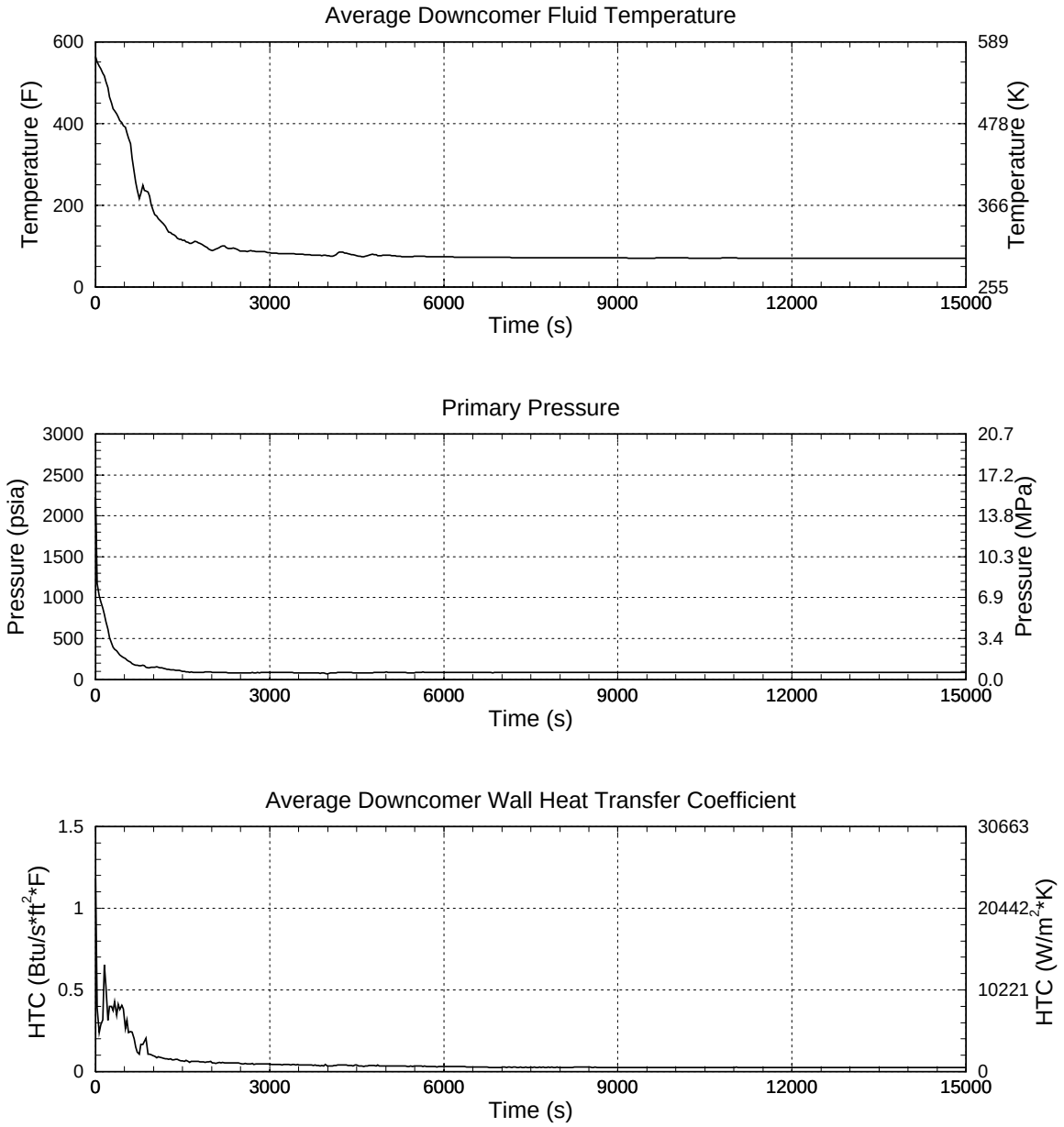


Figure A.2-58: Oconee PTS Results for Case 053

Case Category	LOCA-Hi K
Primary Failures	5.08 cm (2 in) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	299.3 K (79.0°F) at 13680 s
Comments	None.

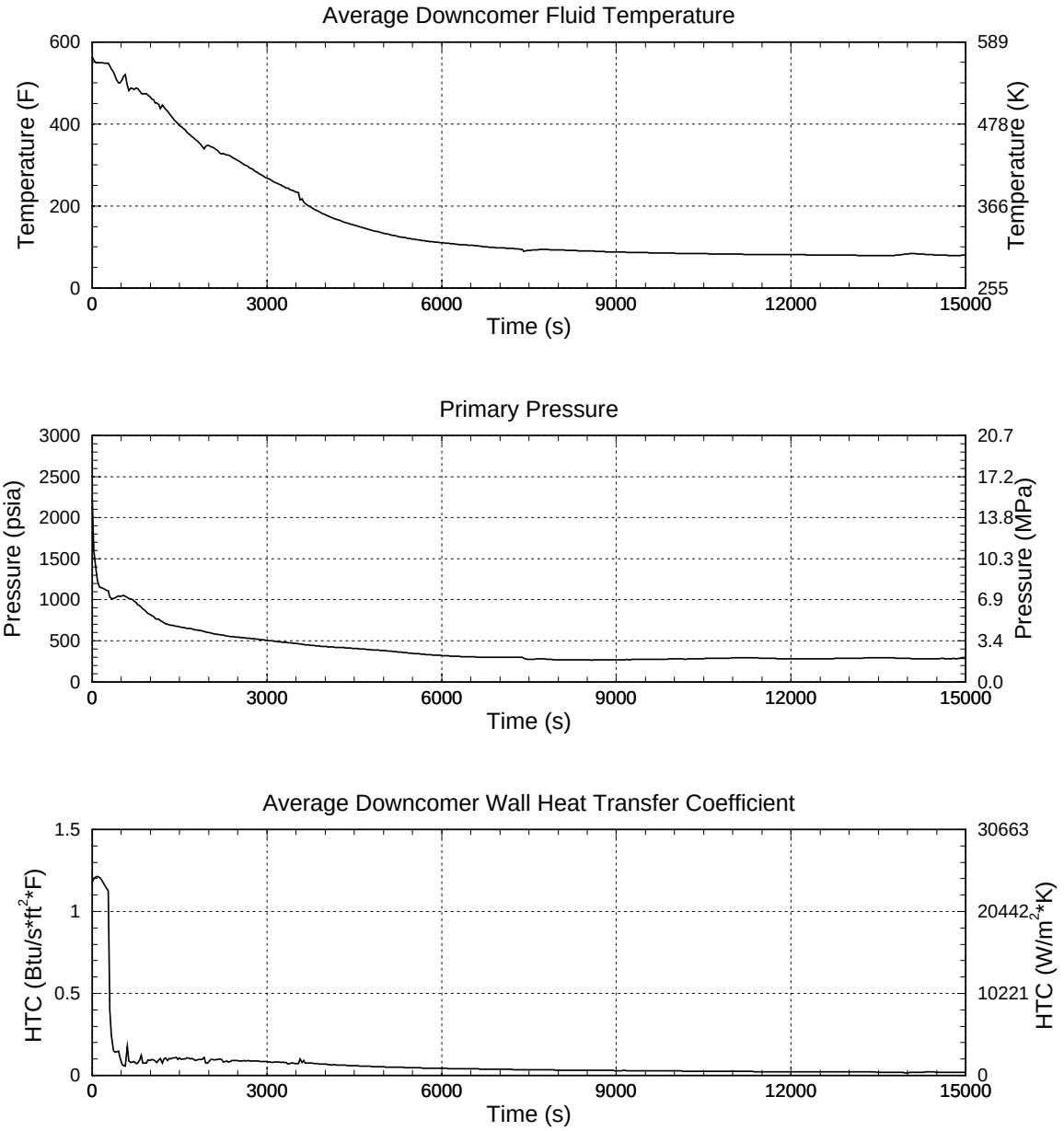


Figure A.2-59: Oconee PTS Results for Case 054

Case Category	LOCA-Hi K
Primary Failures	7.183 cm (2.828 in) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	295.8 K (72.7°F) at 14190 s
Comments	None.

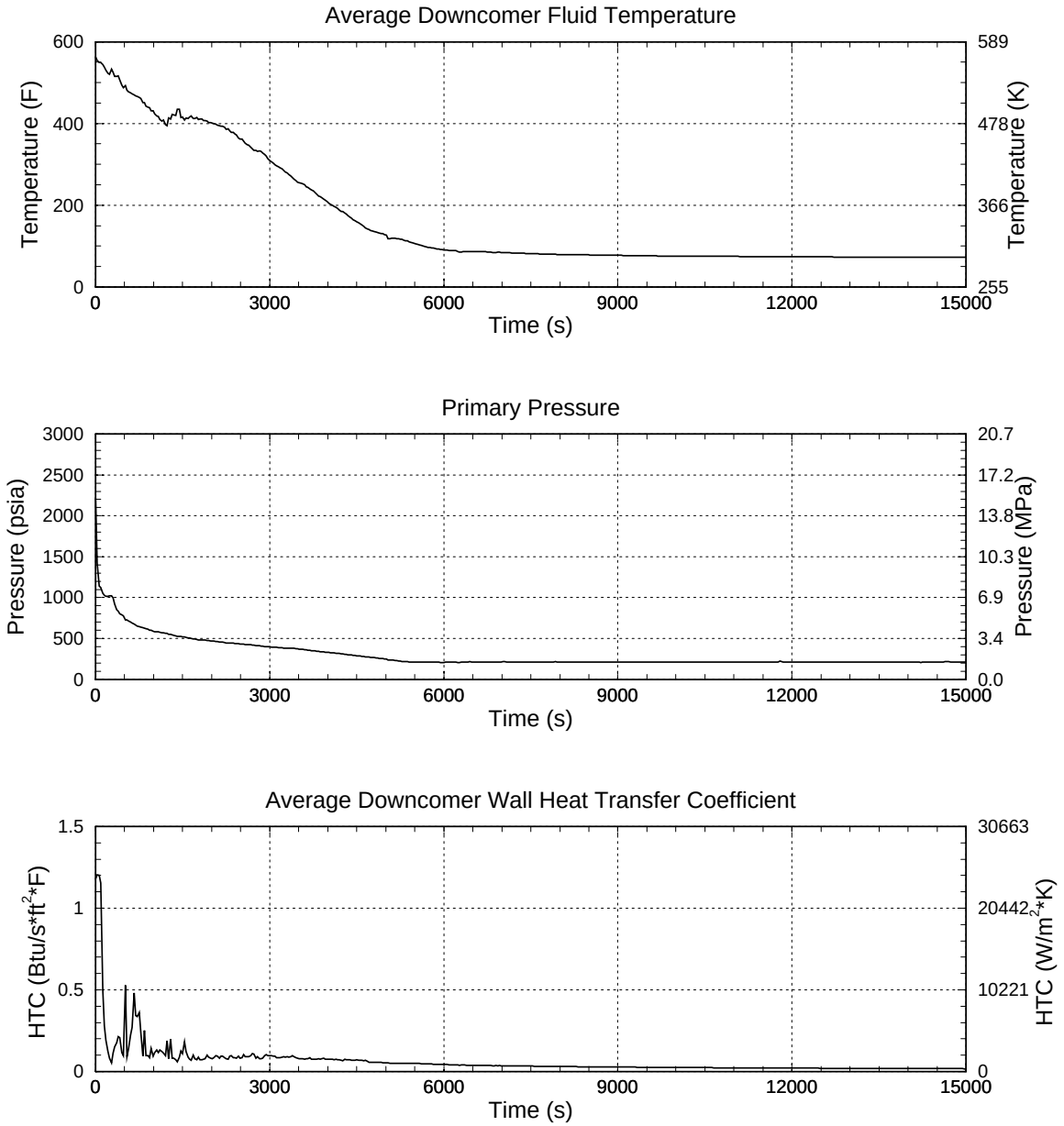


Figure A.2-60: Oconee PTS Results for Case 055

Case Category	TT/RT-Hi K
Primary Failures	Stuck open pressurizer safety valve.
Secondary Failures	None
Operator Actions	None
Min DC Temp	298.7 K (77.9°F) at 12840 s
Comments	None.

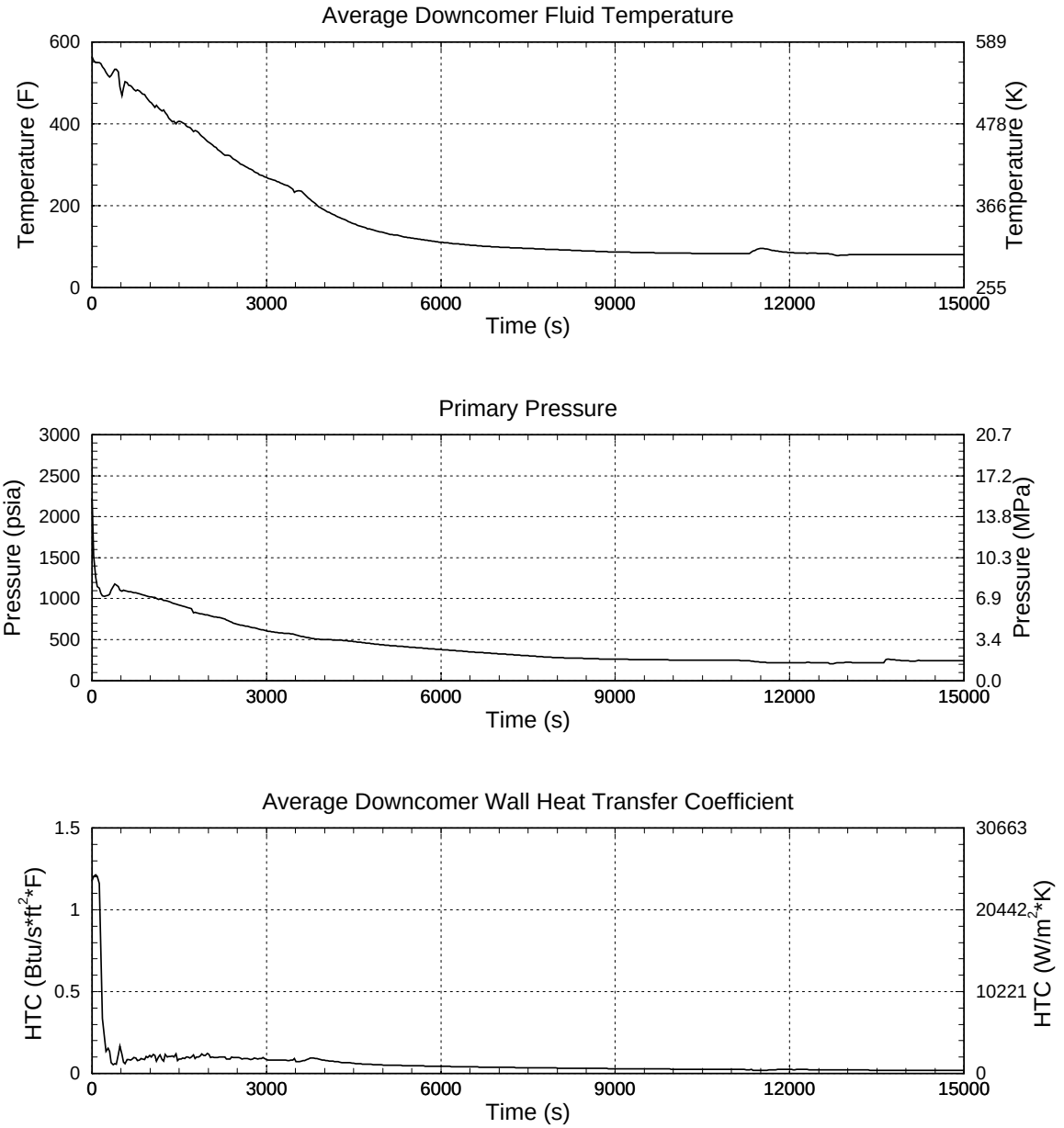


Figure A.2-61: Oconee PTS Results for Case 056

Case Category	TT/RT
Primary Failures	None
Secondary Failures	Two stuck open safety valves in SG-A.
Operator Actions	Operator isolates EFW in SG-A.
Min DC Temp	529.9 K (494.1°F) at 990 s
Comments	None.

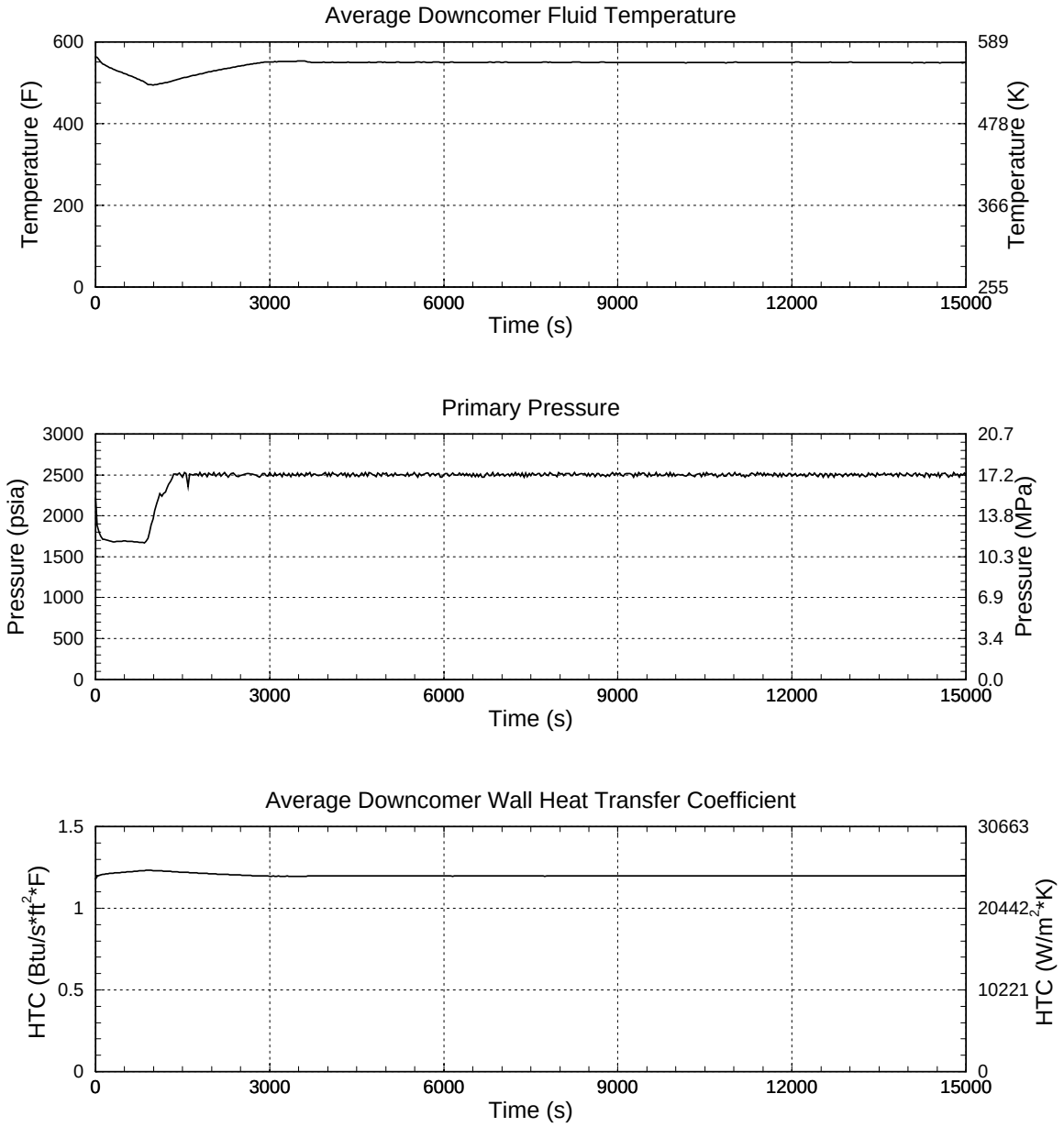


Figure A.2-62: Oconee PTS Results for Case 057

Case Category	LOCA-Hi K
Primary Failures	10.16 cm (4 inch) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	294.5 K (70.5°F) at 15000 s
Comments	None.

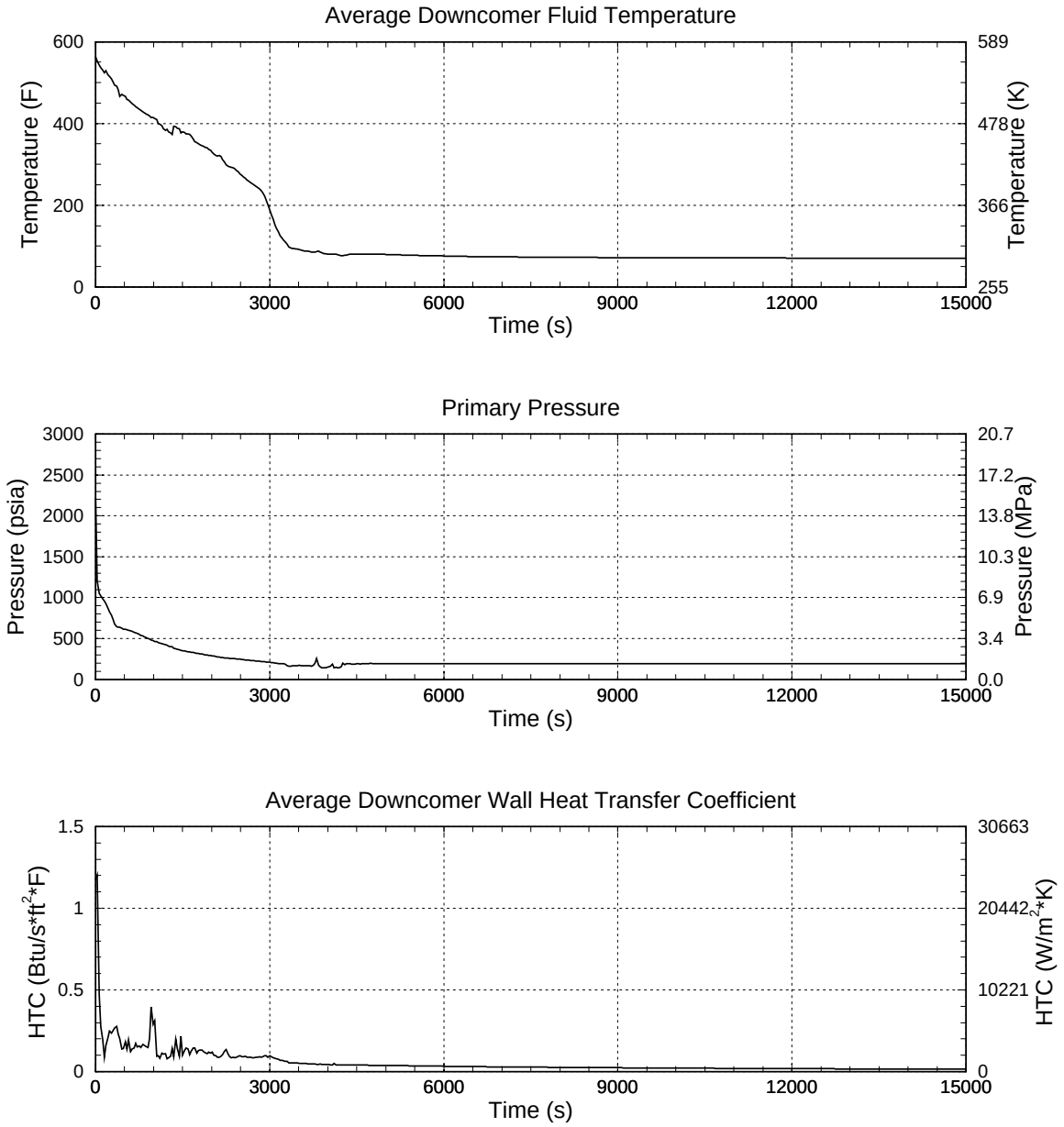


Figure A.2-63: Oconee PTS Results for Case 058

Case Category	TT/RT
Primary Failures	None
Secondary Failures	2 stuck open safety valves in SG-A
Operator Actions	Operator throttles HPI to maintain 27.8 K (50oF) subcooling and pressurizer level of 304 cm (120 inches). The operator stops emergency feedwater flow to SG-A at 15 minutes after accident initiation.
Min DC Temp	489.6 K (421.6°F) at 930 s
Comments	None.

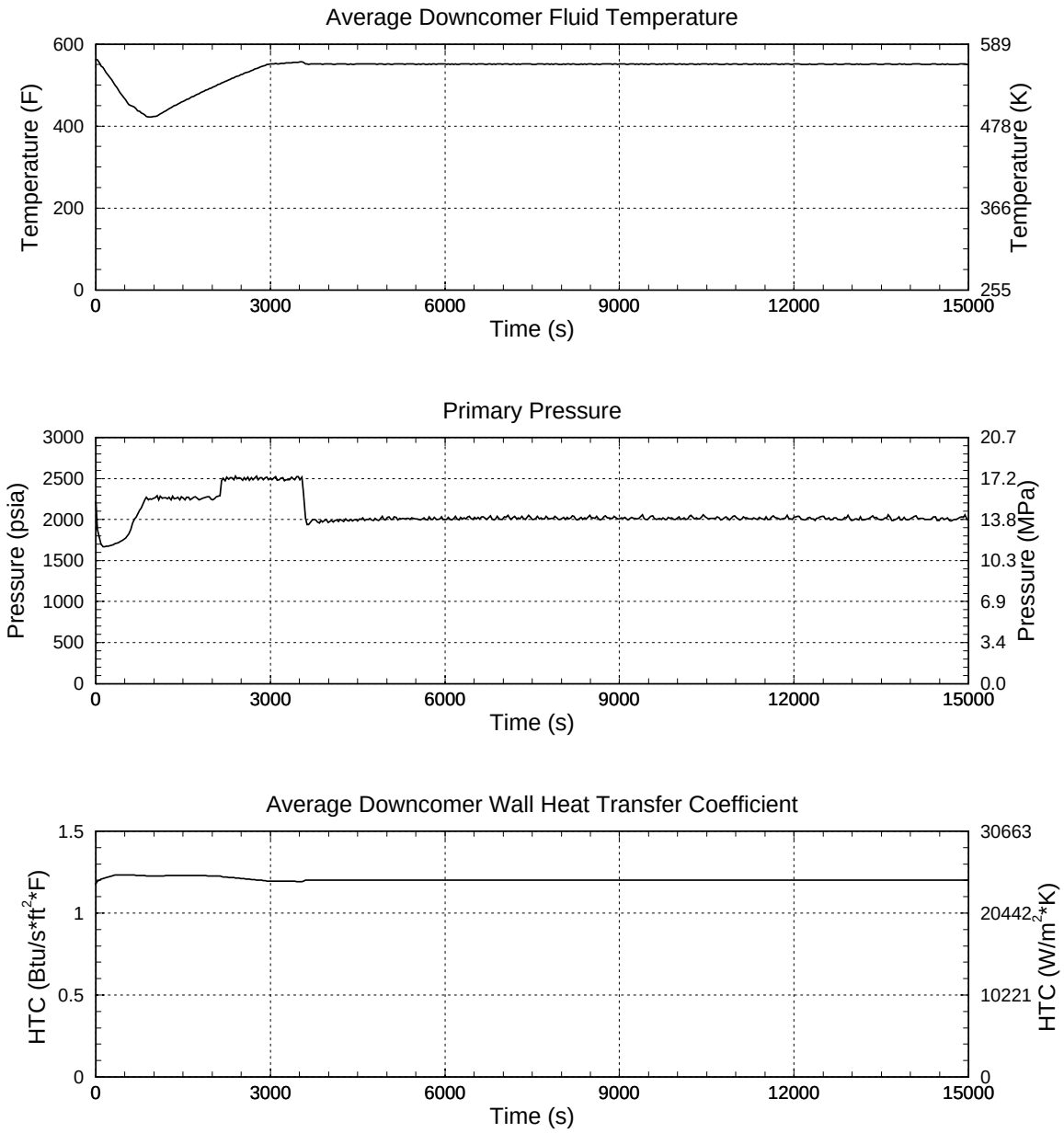


Figure A.2-64: Oconee PTS Results for Case 059

Case Category	TT/RT - HZP
Primary Failures	None
Secondary Failures	2 stuck open safety valves in SG-A
Operator Actions	Operator throttles HPI to maintain 27.8 K (50°F) subcooling and pressurizer level of 304 cm (120 inches). The operator stops emergency feedwater flow to SG-A at 15 minutes after accident initiation.
Min DC Temp	432.2 K (318.3°F) at 14820 s
Comments	None.

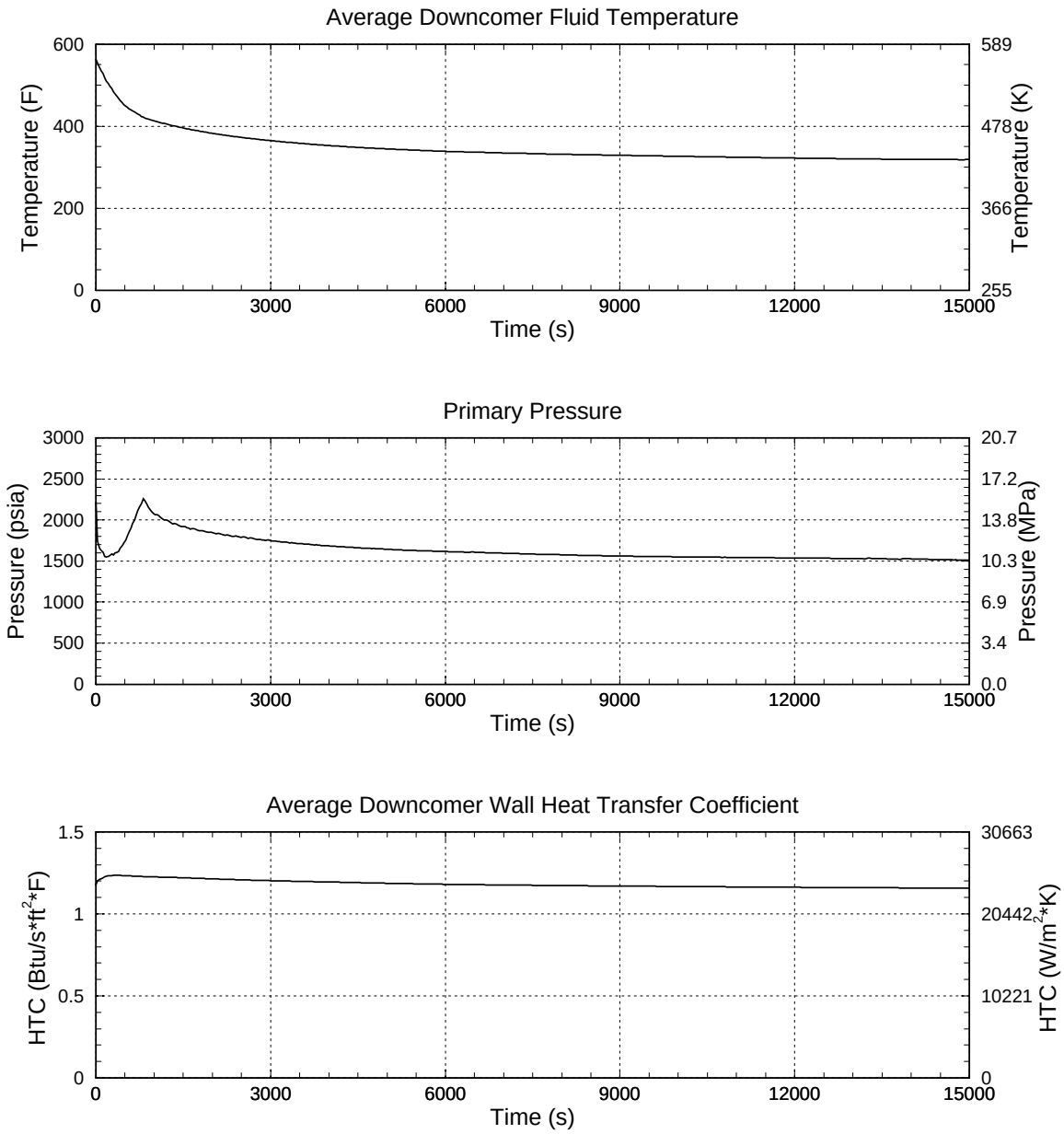


Figure A.2-65: Oconee PTS Results for Case 060

Case Category	MSLB
Primary Failures	None
Secondary Failures	MSLB with shutdown of the MFW and the turbine driven EFW pumps by the MSLB circuitry.
Operator Actions	Operator stops motor driven EFW flow to the affected SG after 10 minutes.
Min DC Temp	559.0 K (546.5°F) at 600 s
Comments	None.

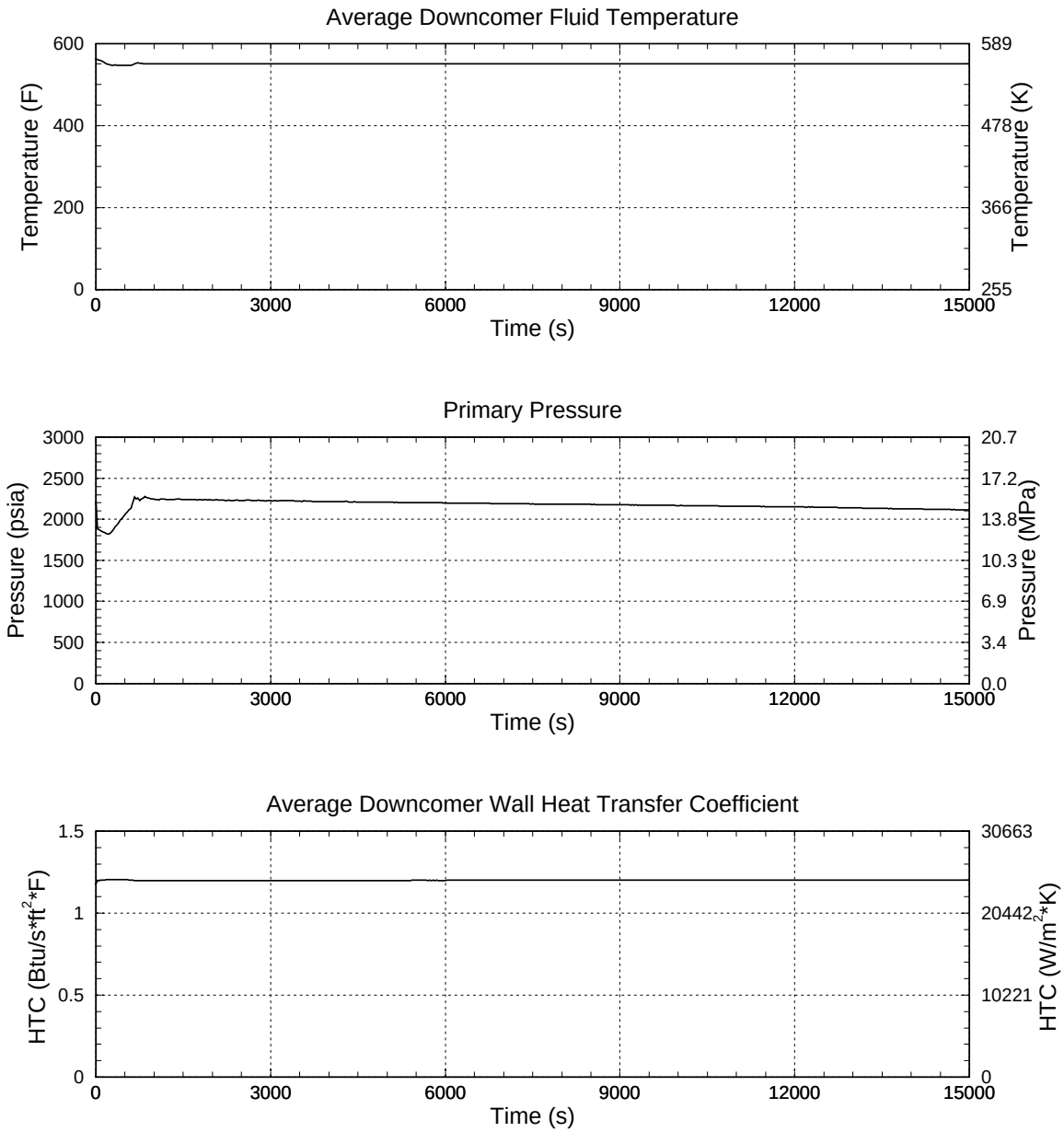


Figure A.2-66: Oconee PTS Results for Case 061

Case Category	MSLB
Primary Failures	None
Secondary Failures	MSLB with shutdown of the MFW and the turbine driven EFW pumps by the MSLB circuitry. Break occurs in the containment so that RCP trip occurs due to a containment isolation signal at 1 minute after break initiation.
Operator Actions	None
Min DC Temp	377.5 K (219.8°F) at 6540 s
Comments	None.

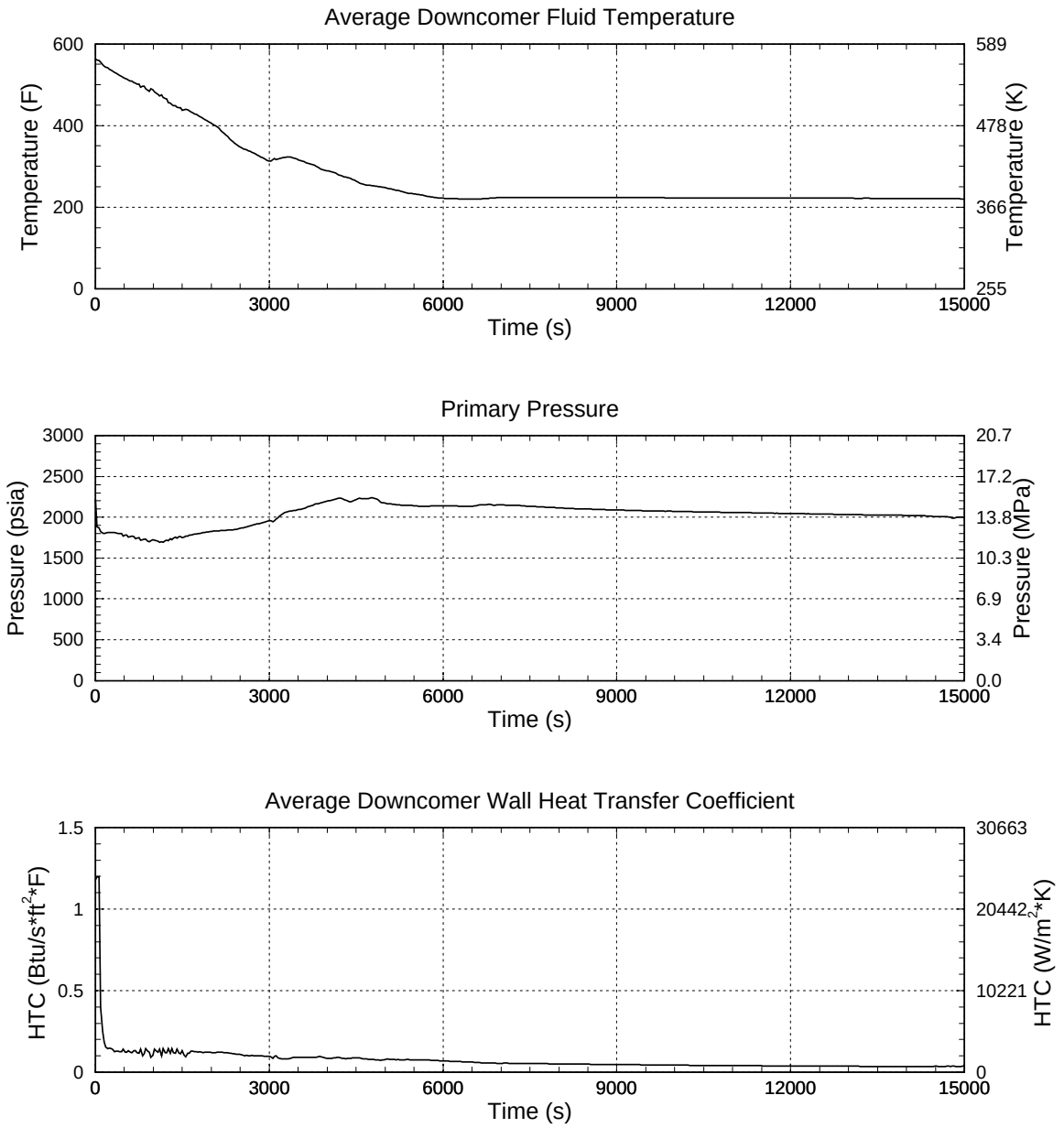


Figure A.2-67: Oconee PTS Results for Case 062

Case Category	LOCA
Primary Failures	5.08 cm (2 in) surge line break. Core flood tank temperature of 294 K (70°F). Nominal temperature is 300 K (80°F)
Secondary Failures	None
Operator Actions	None
Min DC Temp	306.8 K (92.5°F) at 14970 s
Comments	None.

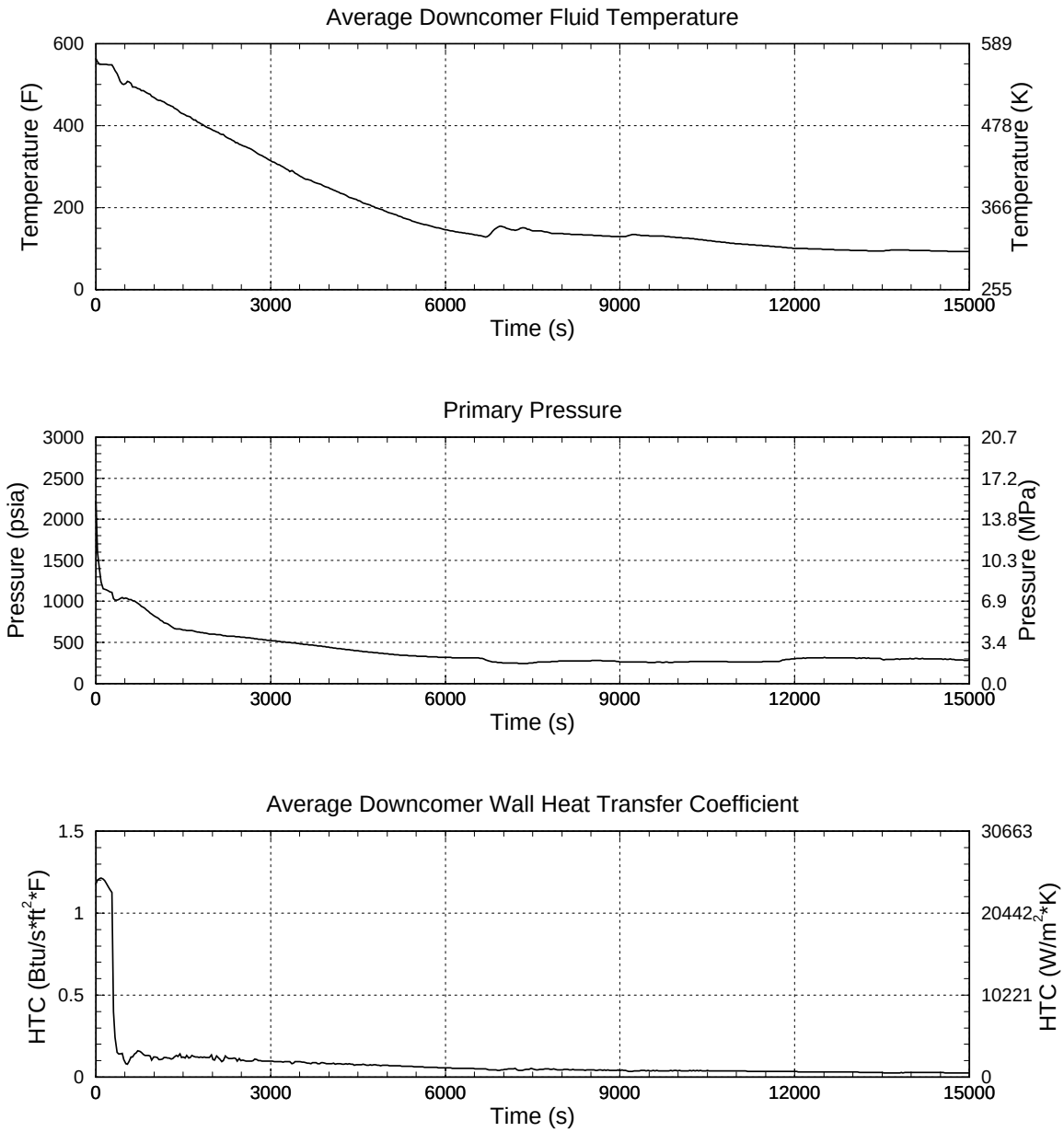


Figure A.2-68: Oconee PTS Results for Case 063

Case Category	LOCA
Primary Failures	5.08 cm (2 in) surge line break. Core flood tank temperature of 310 K (100°F). Nominal temperature is 300 K (80°F)
Secondary Failures	None
Operator Actions	None
Min DC Temp	304.3 K (88.0°F) at 15000 s
Comments	None.

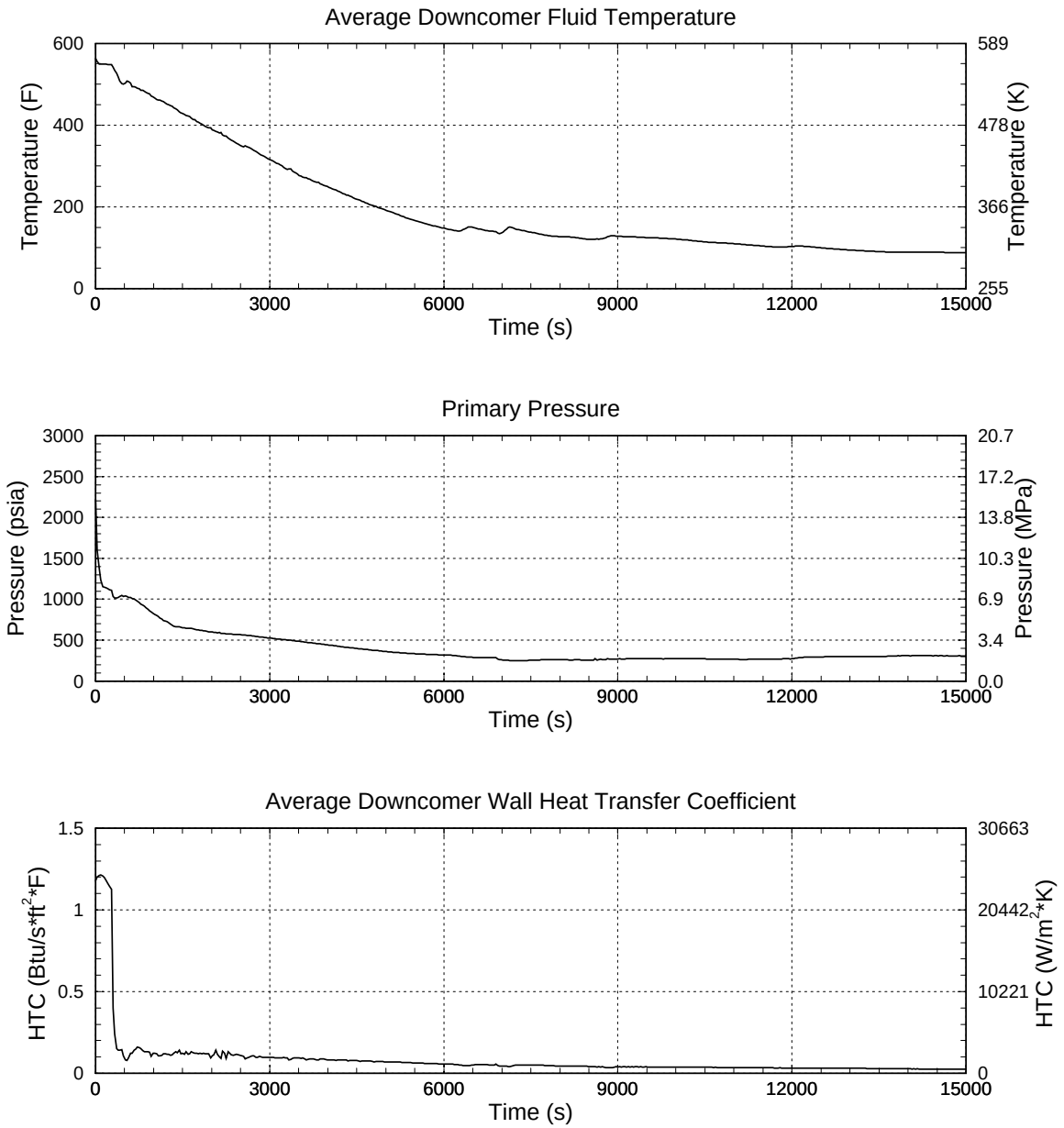


Figure A.2-69: Oconee PTS Results for Case 064

Case Category	LOCA
Primary Failures	5.08 cm (2 in) surge line break. HPI temperature of 278 K (40°F). Nominal temperature is 294 K (70°F)
Secondary Failures	None
Operator Actions	None
Min DC Temp	291.9 K (65.8°F) at 12060 s
Comments	None.

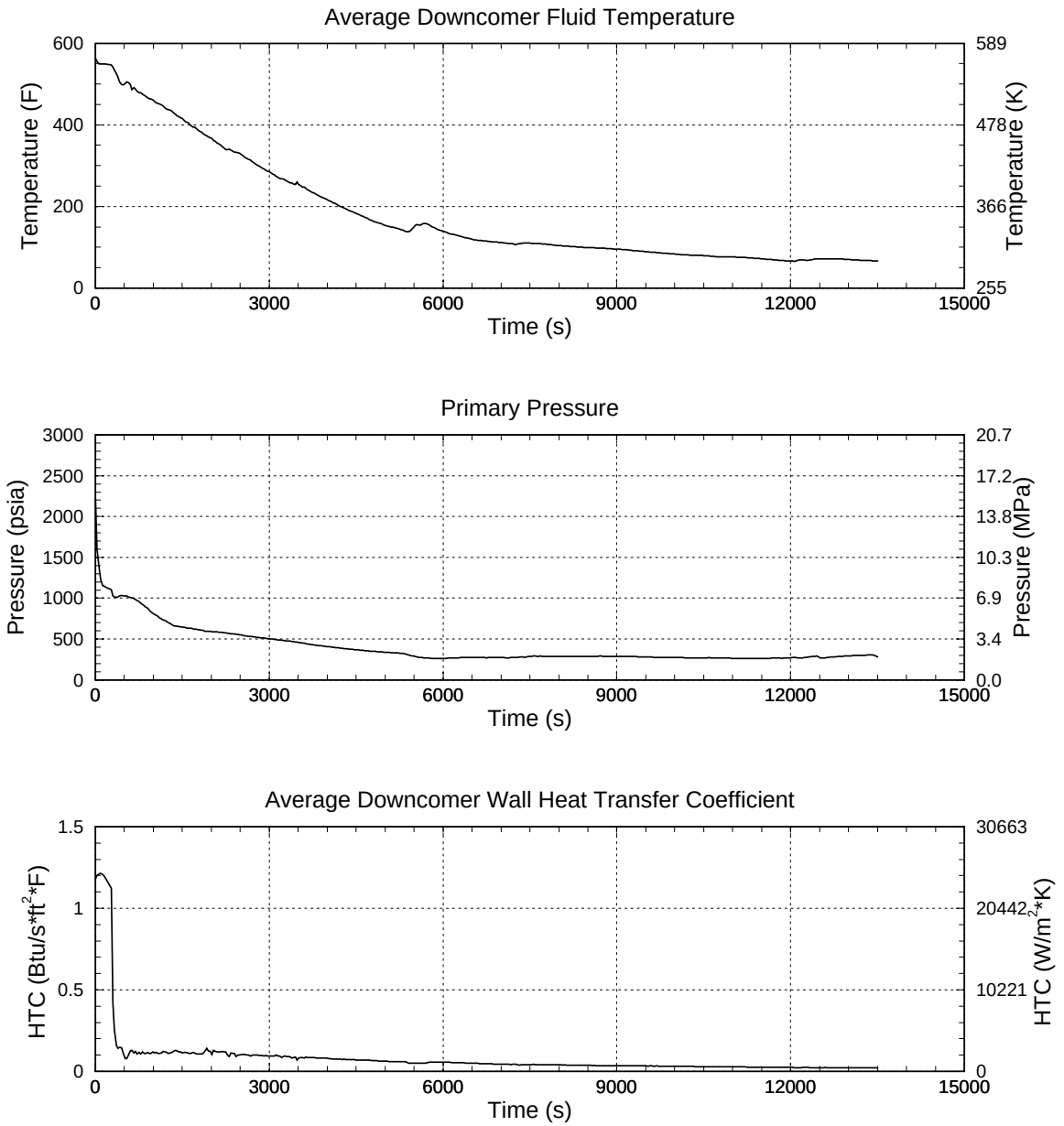


Figure A.2-70: Oconee PTS Results for Case 065

Case Category	LOCA
Primary Failures	5.08 cm (2 in) surge line break. HPI temperature of 300 K (80°F). Nominal temperature is 294 K (70°F).
Secondary Failures	None
Operator Actions	None
Min DC Temp	311.6 K (101.3°F) at 14340 s
Comments	None.

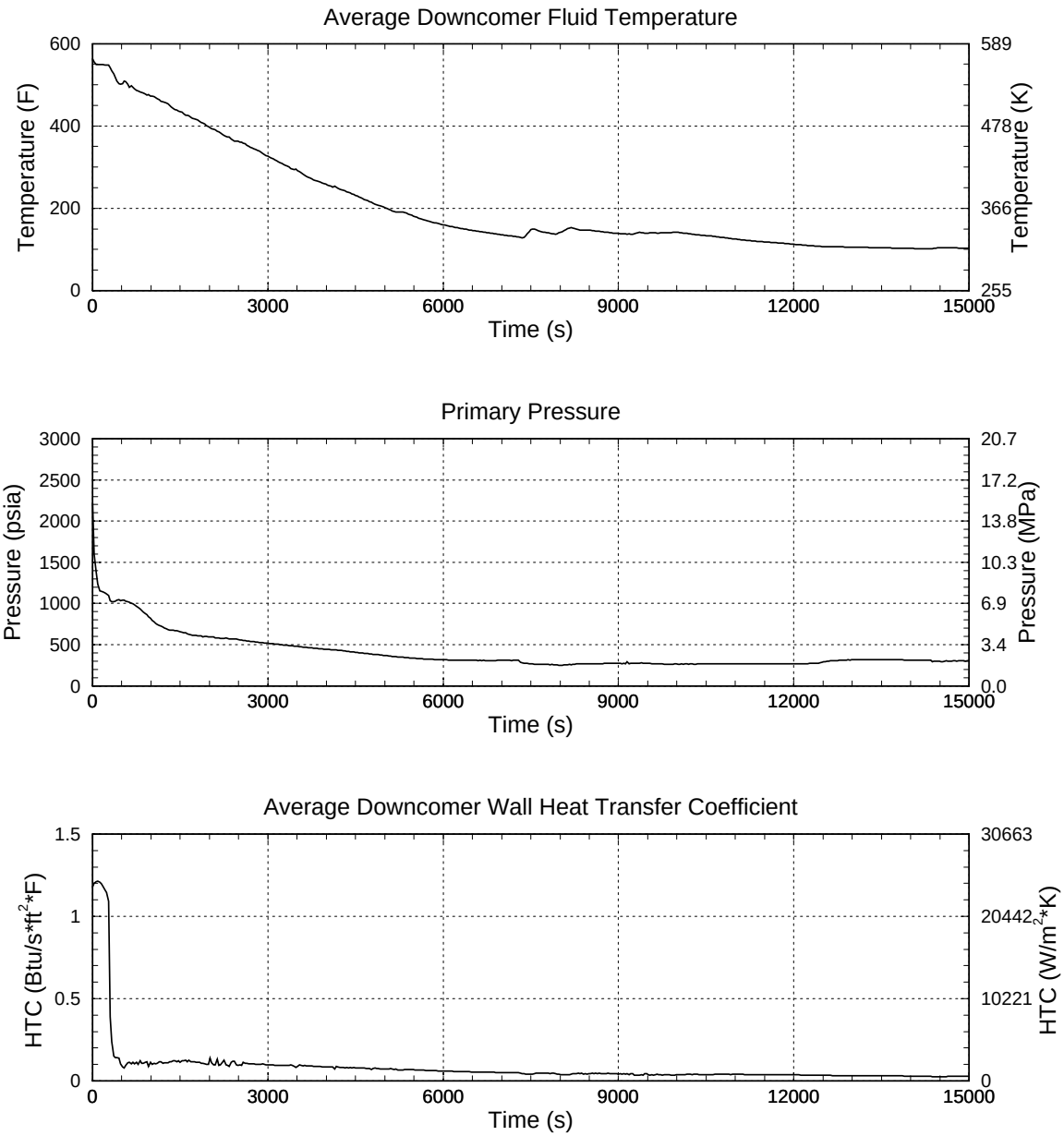


Figure A.2-71: Oconee PTS Results for Case 066

Case Category	LOCA
Primary Failures	5.08 cm (2 in) surge line break. Increased effective heat transfer coefficient used (1.3 x HTC).
Secondary Failures	None
Operator Actions	None
Min DC Temp	310.5 K (99.2°F) at 15000 s
Comments	None.

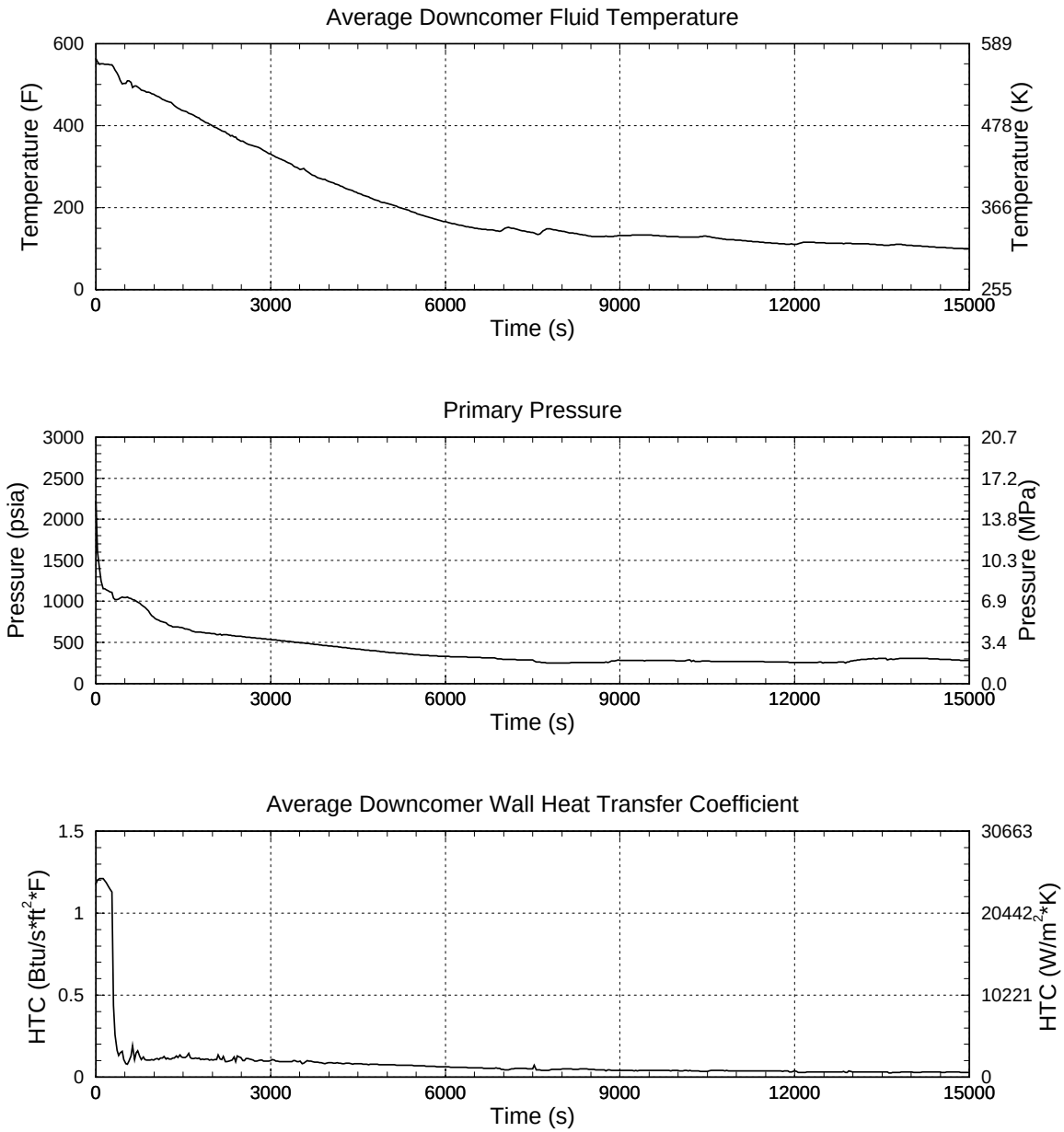
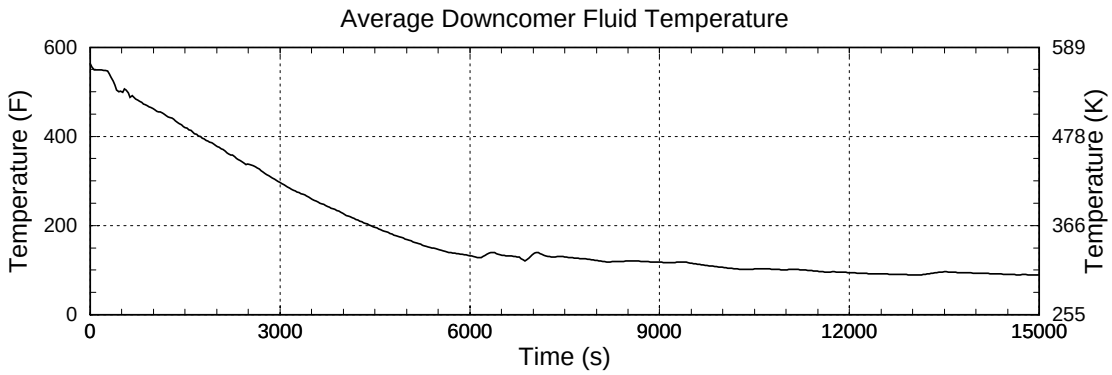
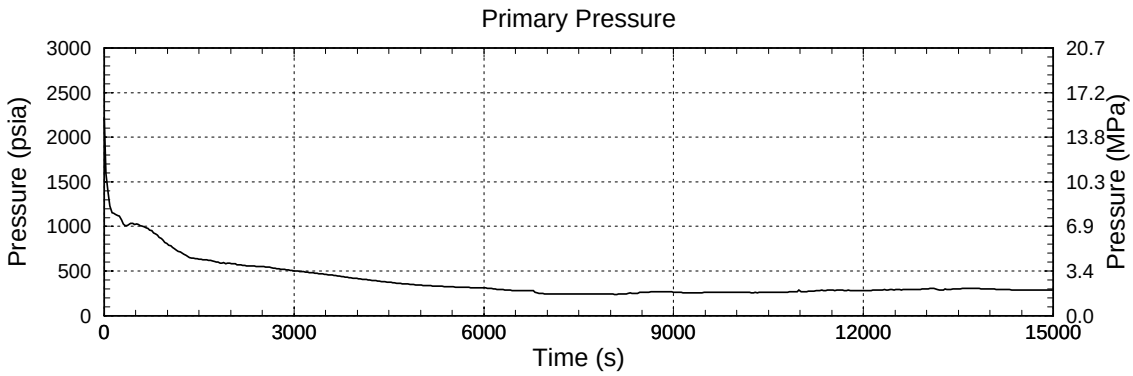


Figure A.2-72: Oconee PTS Results for Case 067

Case Category	LOCA
Primary Failures	5.08 cm (2 in) surge line break. Decreased effective heat transfer coefficient used (0.7 x HTC).
Secondary Failures	None
Operator Actions	None
Min DC Temp	304.7 K (88.8°F) at 15000 s
Comments	None.





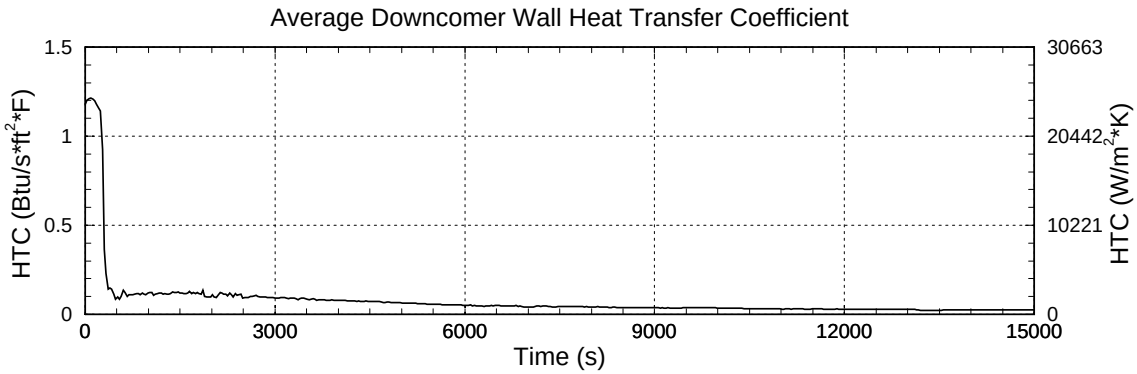


Figure A.2-73: Oconee PTS Results for Case 068

Case Category	LOCA
Primary Failures	5.08 cm (2 in) surge line break. Increased loop flow resistance to reduce natural circulation (100 % increase).
Secondary Failures	None
Operator Actions	None
Min DC Temp	306.1 K (91.4°F) at 15000 s
Comments	None.

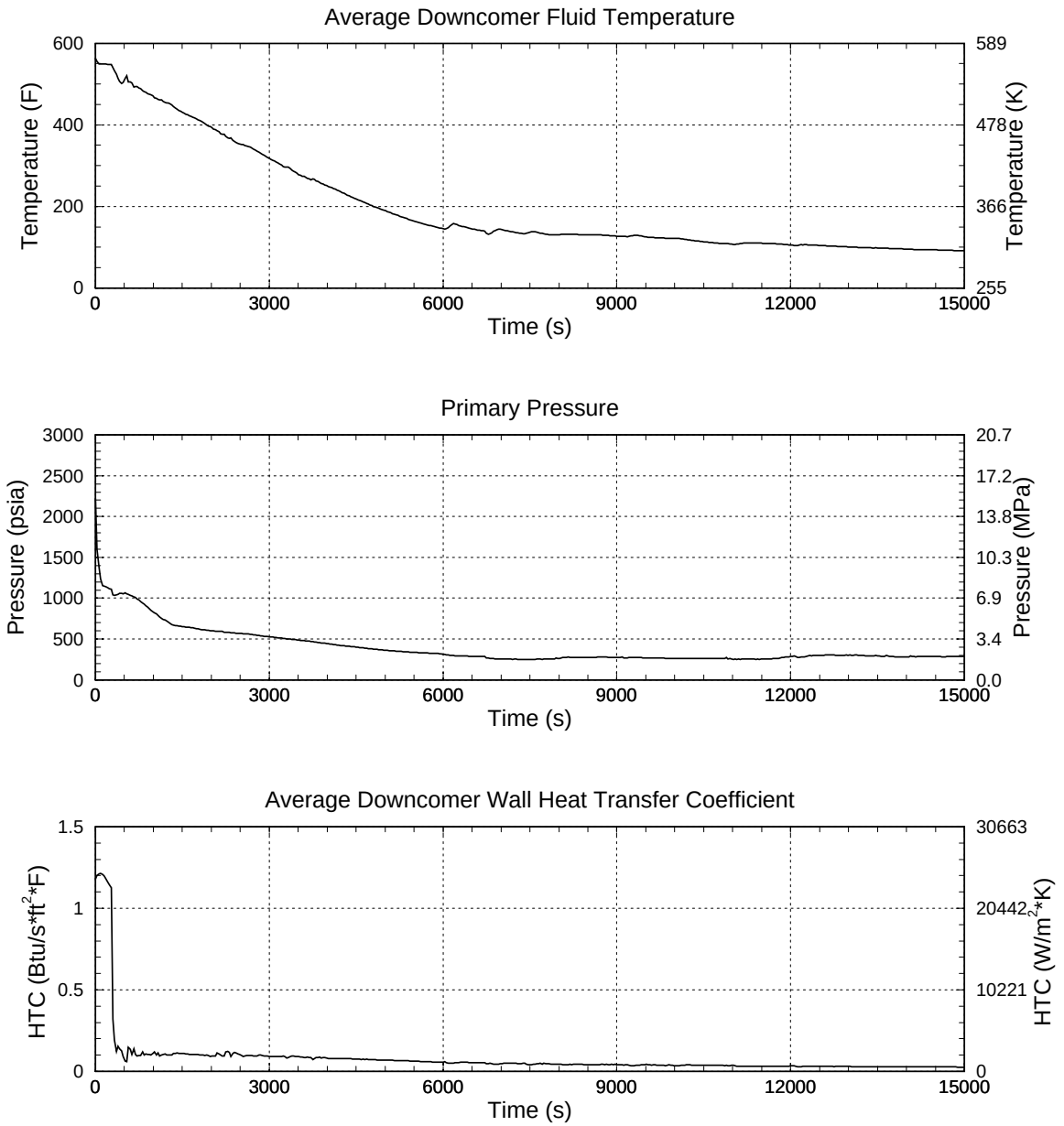


Figure A.2-74: Oconee PTS Results for Case 069

Case Category	LOCA-HZP
Primary Failures	5.08 cm (2 inch) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	299.7 K (79.9°F) at 15000 s
Comments	None.

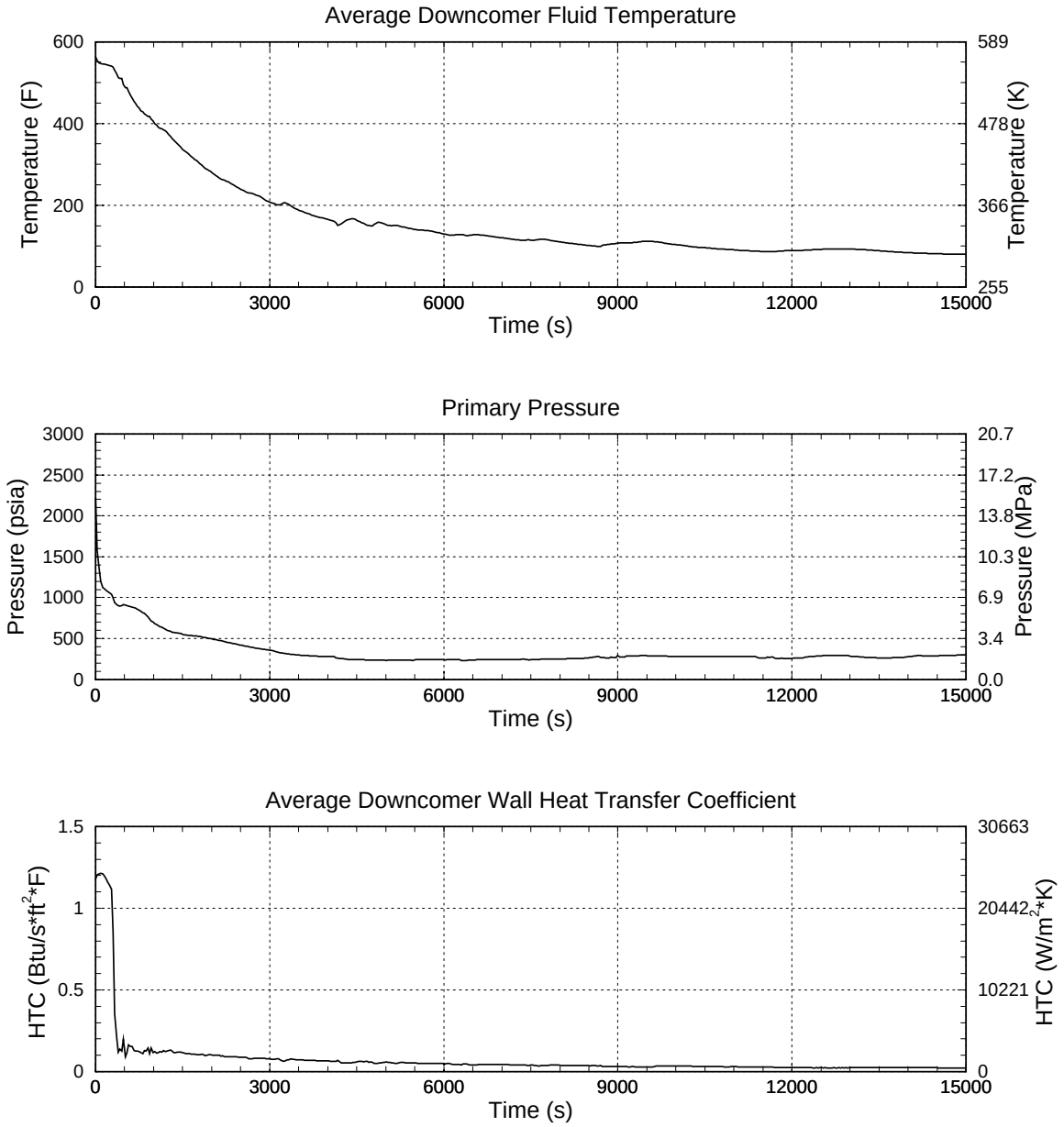


Figure A.2-75: Oconee PTS Results for Case 070

Case Category	LOCA
Primary Failures	5.08 cm (2 in) surge line break. Reduced vent valve delta-P required to open by a factor of 0.5.
Secondary Failures	None
Operator Actions	None
Min DC Temp	305.6 K (90.4°F) at 15000 s
Comments	None.

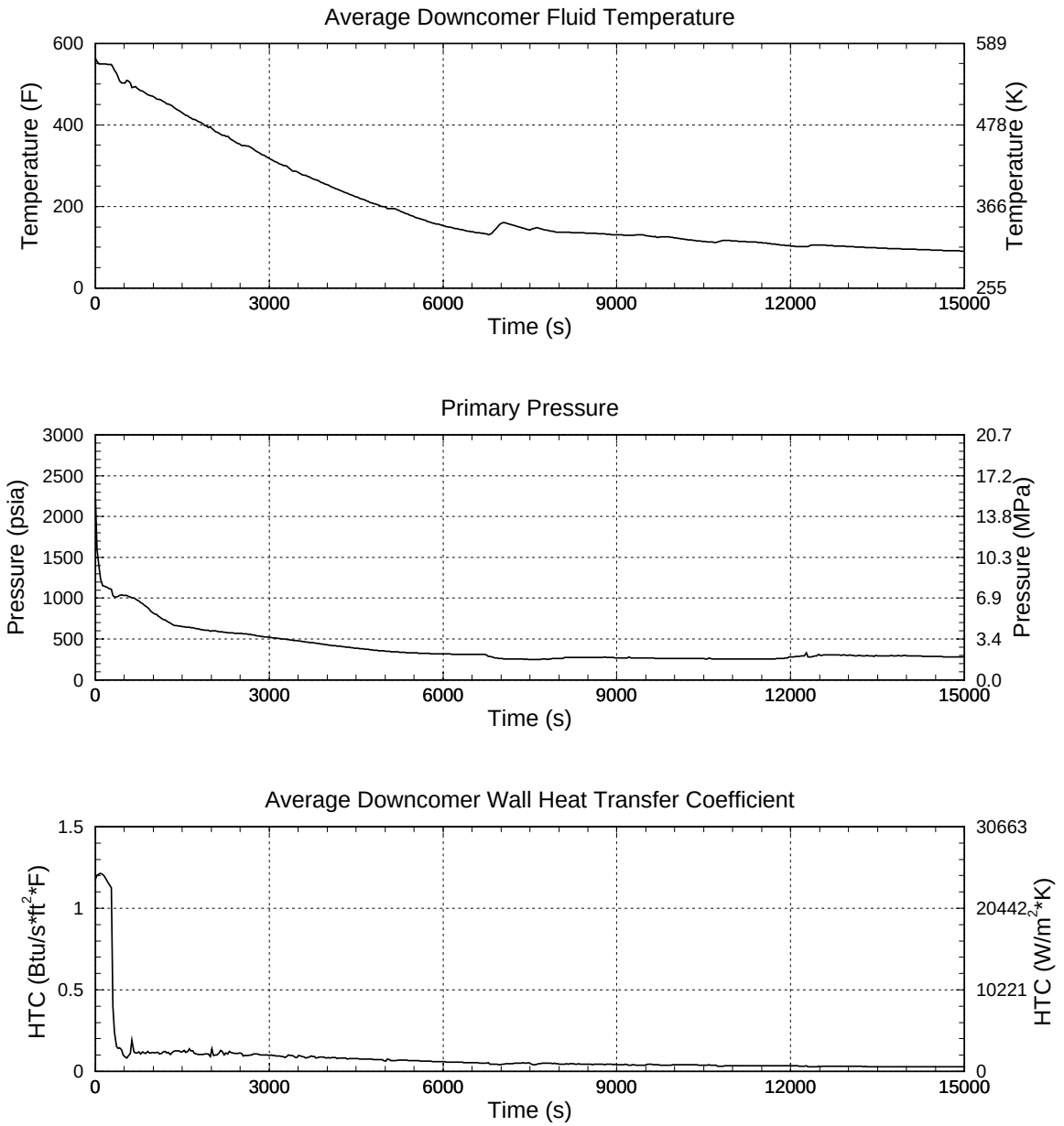


Figure A.2-76: Oconee PTS Results for Case 071

Case Category	LOCA
Primary Failures	5.08 cm (2 in) surge line break. No vent valve function.
Secondary Failures	None
Operator Actions	None
Min DC Temp	301.7 K (83.3°F) at 15000 s
Comments	None.

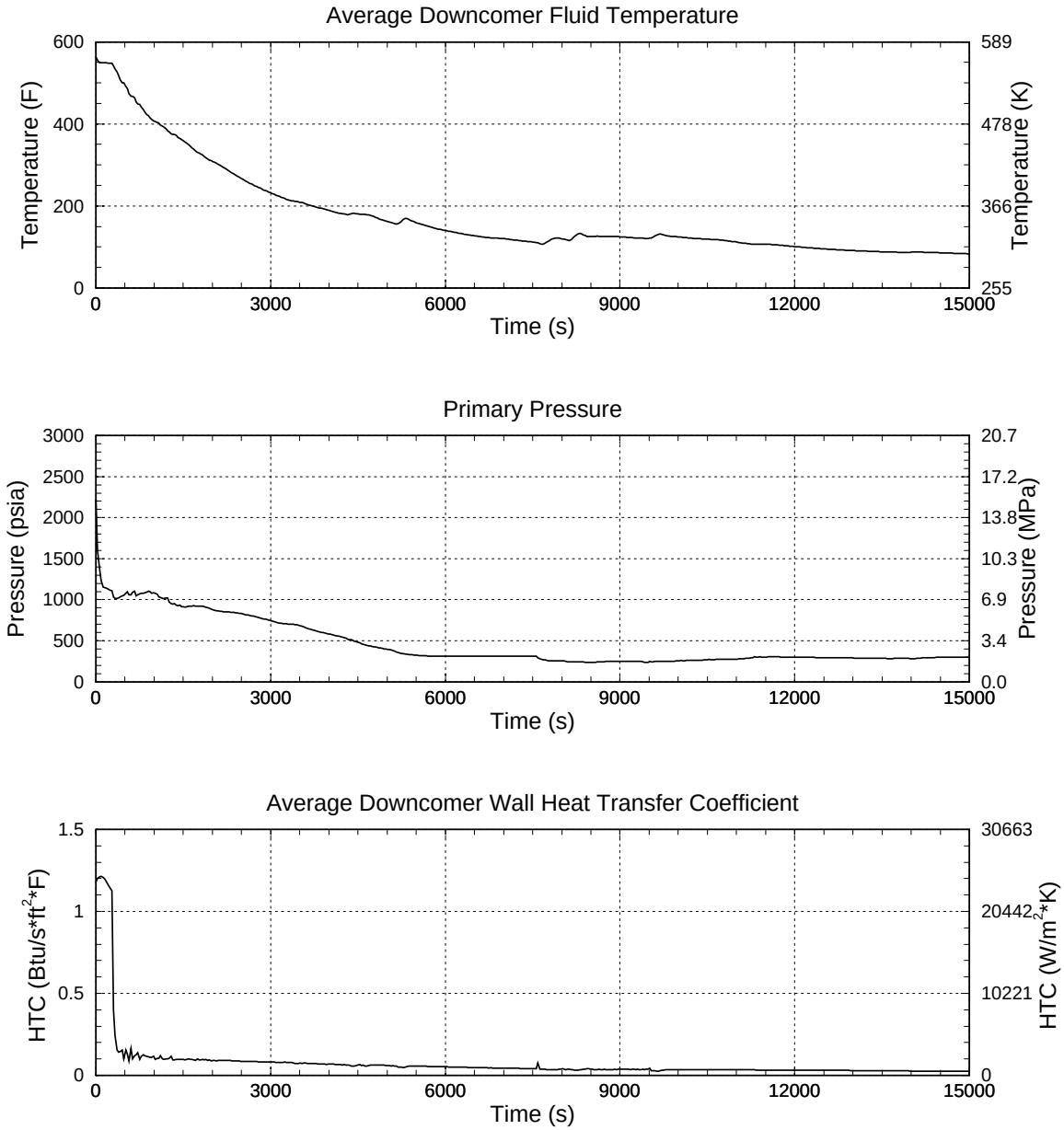


Figure A.2-77: Oconee PTS Results for Case 072

Case Category	LOCA-HZP
Primary Failures	14.366 cm (5.656 in) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	294.3 K (70.0°F) at 15000 s
Comments	None.

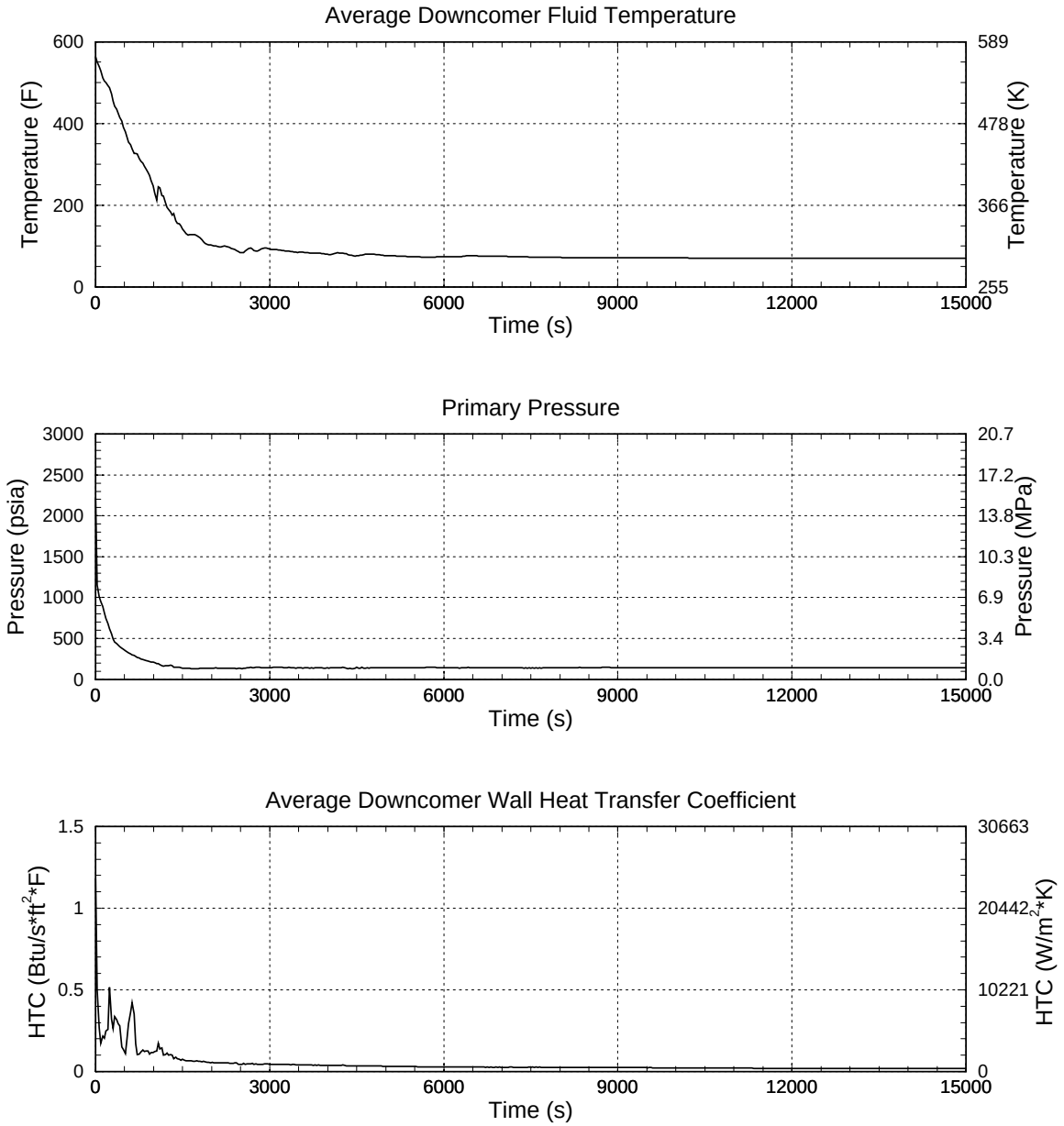


Figure A.2-78: Oconee PTS Results for Case 073

Case Category	LOCA-HZP
Primary Failures	2.54 cm (1 in) surge line break with HPI Failure
Secondary Failures	None
Operator Actions	At 15 minutes after transient initiation, the operator opens all TBVs to lower primary system pressure and allow core flood tank and LPI injection.
Min DC Temp	346.9 K (164.7°F) at 14970 s
Comments	None.

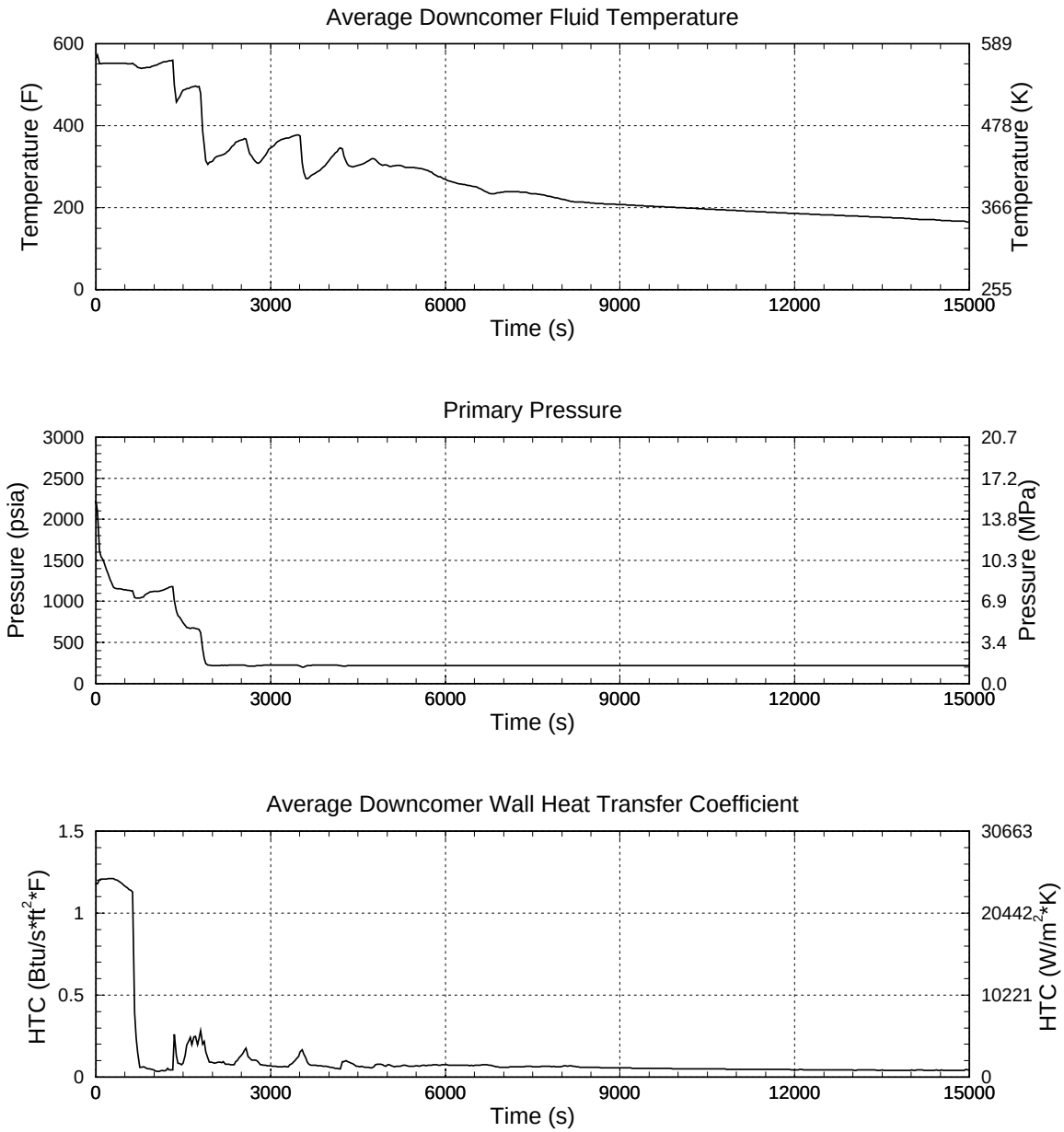


Figure A.2-79: Oconee PTS Results for Case 074

Case Category	LOCA-HZP
Primary Failures	2.54 cm (1 in) surge line break with HPI Failure
Secondary Failures	None
Operator Actions	At 15 minutes after sequence initiation, operators open all TBVs to depressurize the system to the CFT setpoint. When the CFTs are 50 percent discharged, HPI is assumed to be recovered. The TBVs are assumed remain opened for the duration of the transient.
Min DC Temp	302.5 K (84.7°F) at 15000 s
Comments	None.

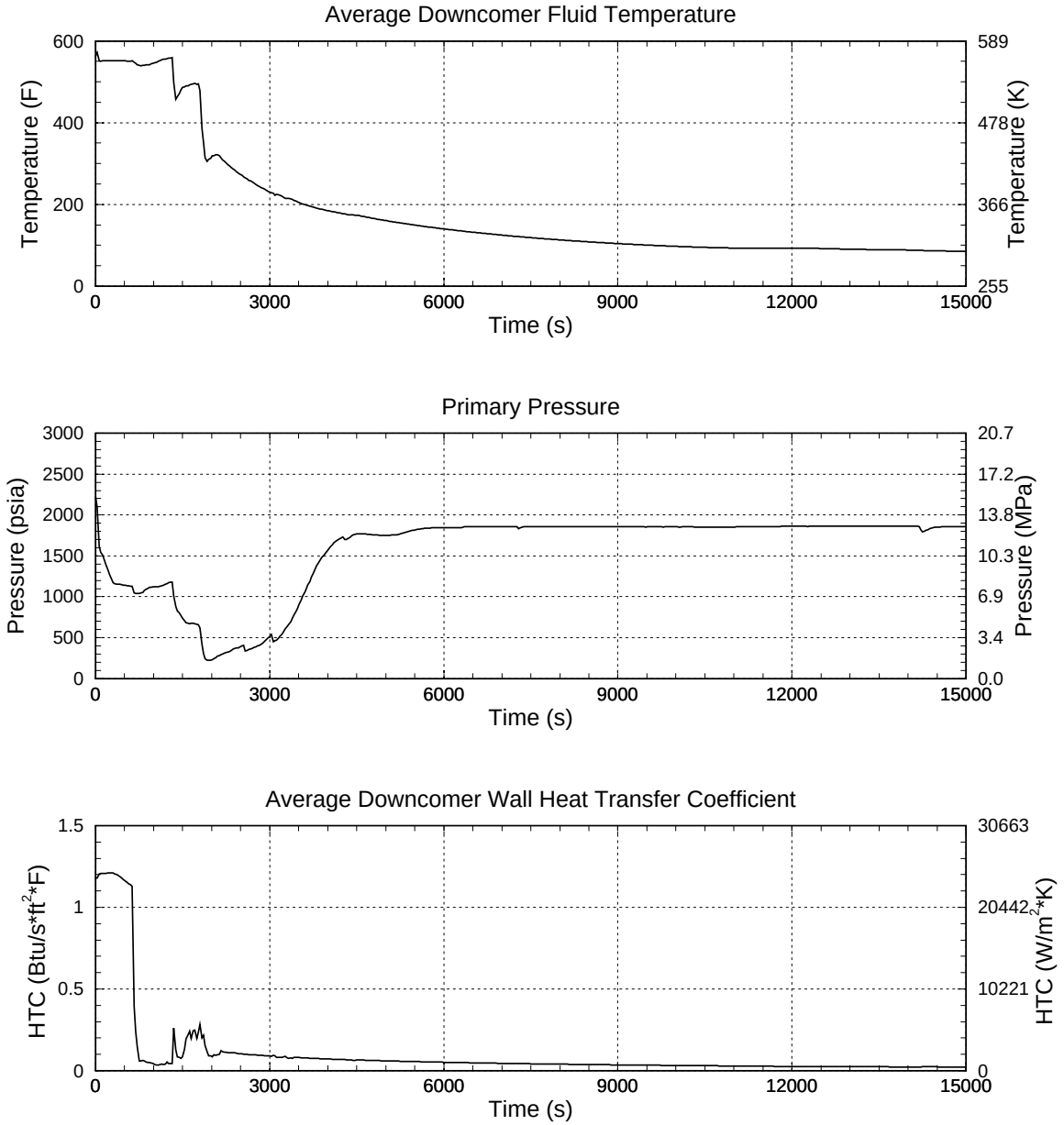


Figure A.2-80: Oconee PTS Results for Case 075

Case Category	LOCA
Primary Failures	3.81 cm (1.5 in) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	323.7 K (123.0°F) at 9780 s
Comments	None.

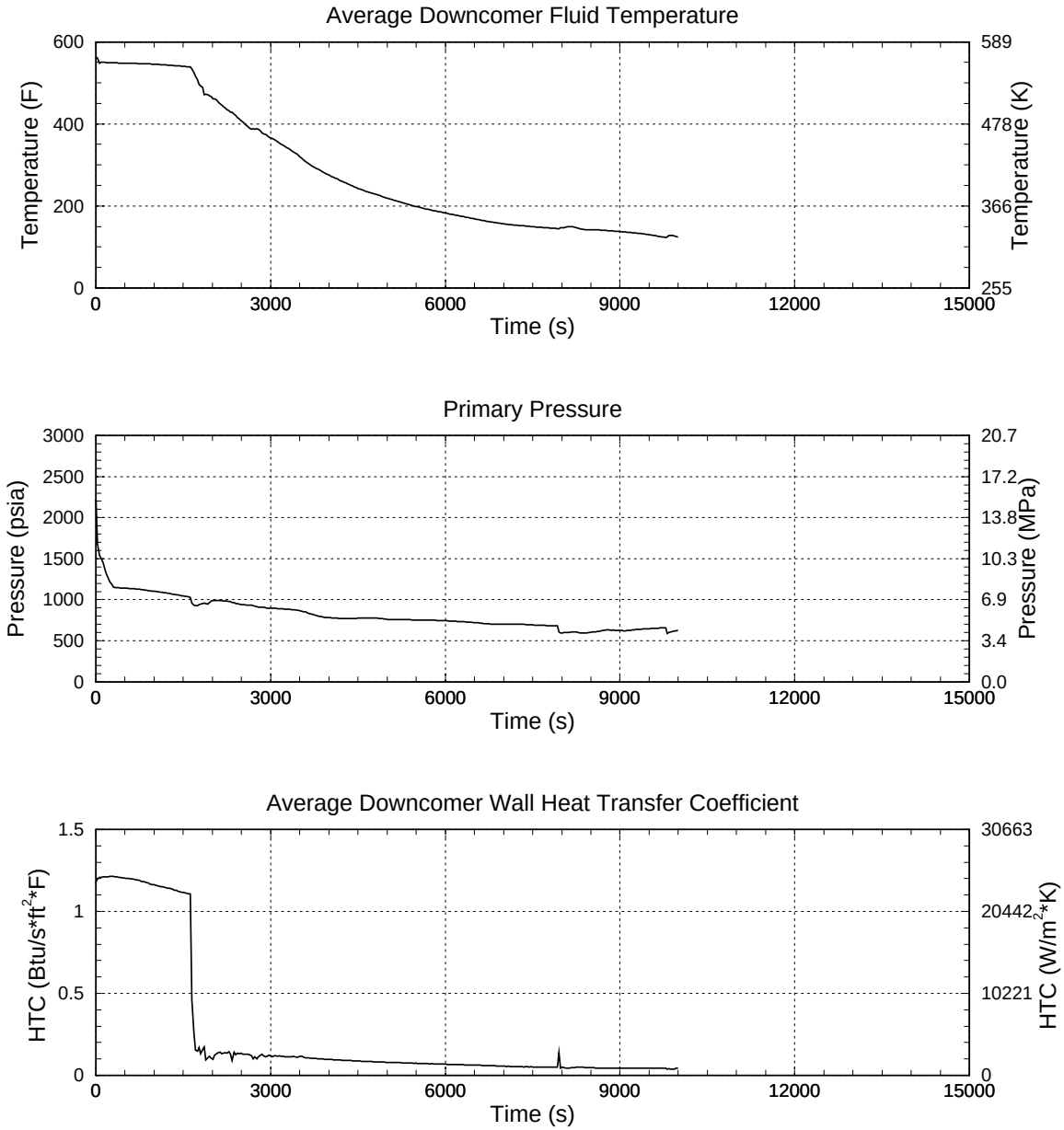


Figure A.2-81: Oconee PTS Results for Case 076

Case Category	TT/RT
Primary Failures	None
Secondary Failures	One stuck open TBV in SG-A. Valve recloses in 20 minutes.
Operator Actions	Operator throttles HPI to maintain 558 cm (220 in) level in the pressurizer.
Min DC Temp	512.9 K (463.6°F) at 1170 s
Comments	None.

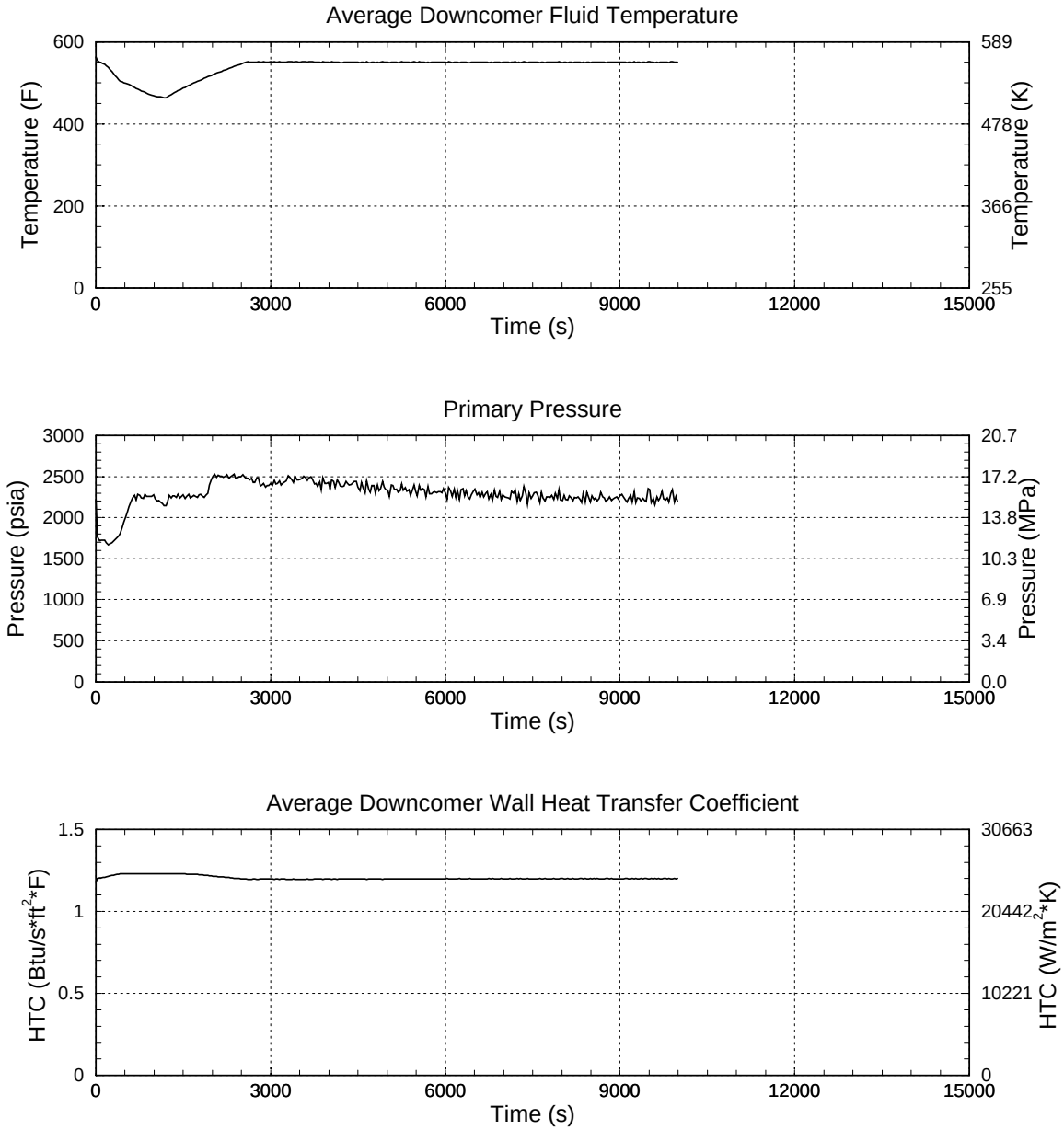


Figure A.2-82: Oconee PTS Results for Case 077

Case Category	LOCA-S
Primary Failures	5.08 cm (2 in) surge line break. No heat structures.
Secondary Failures	None
Operator Actions	None
Min DC Temp	297.4 K (75.7°F) at 15000 s
Comments	None.

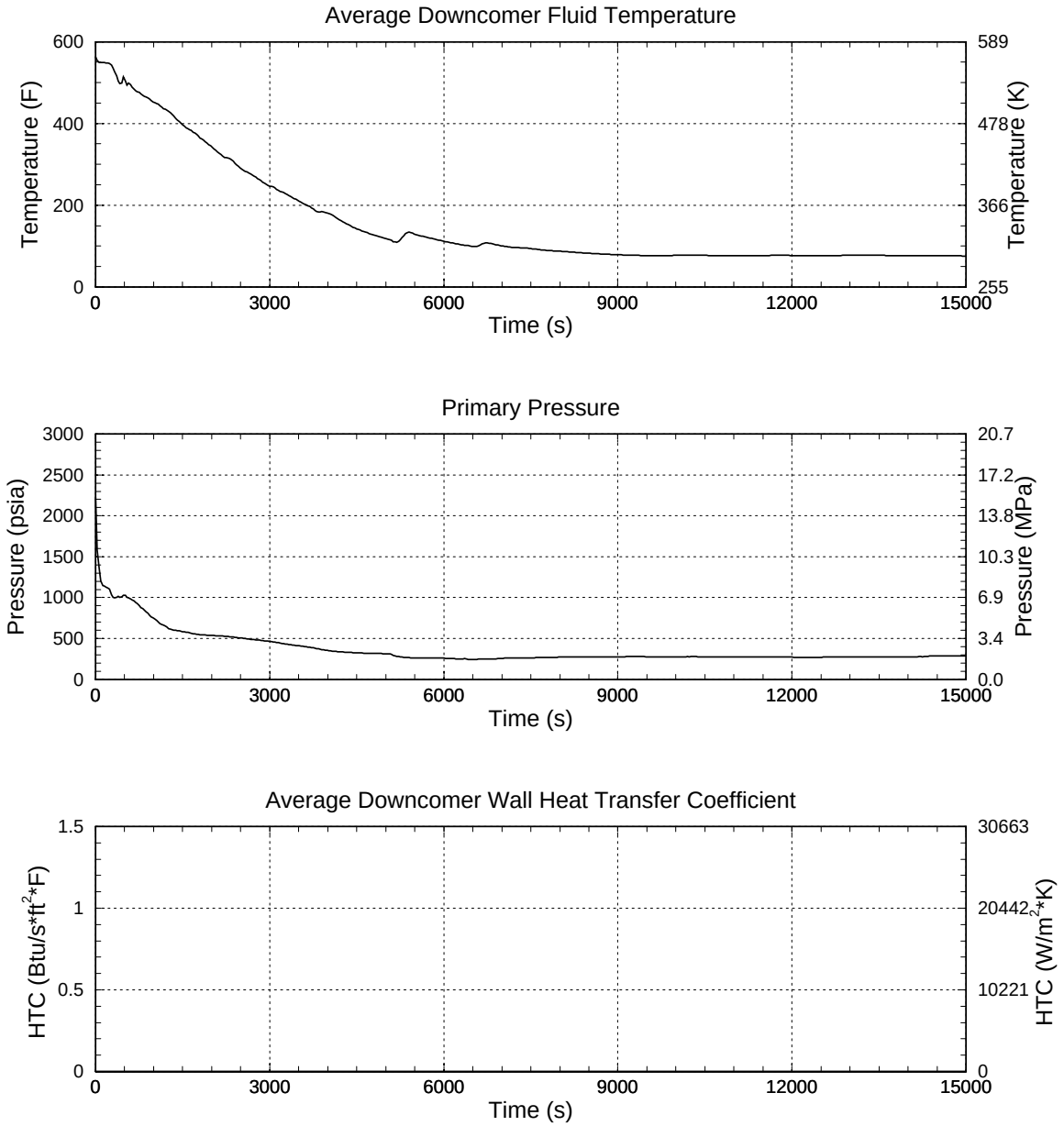


Figure A.2-83: Oconee PTS Results for Case 078

Case Category	LOCA-S
Primary Failures	5.08 cm (2 in) surge line break. No heat structures and no vent valve function.
Secondary Failures	None
Operator Actions	None
Min DC Temp	296.8 K (74.6°F) at 10620 s
Comments	None.

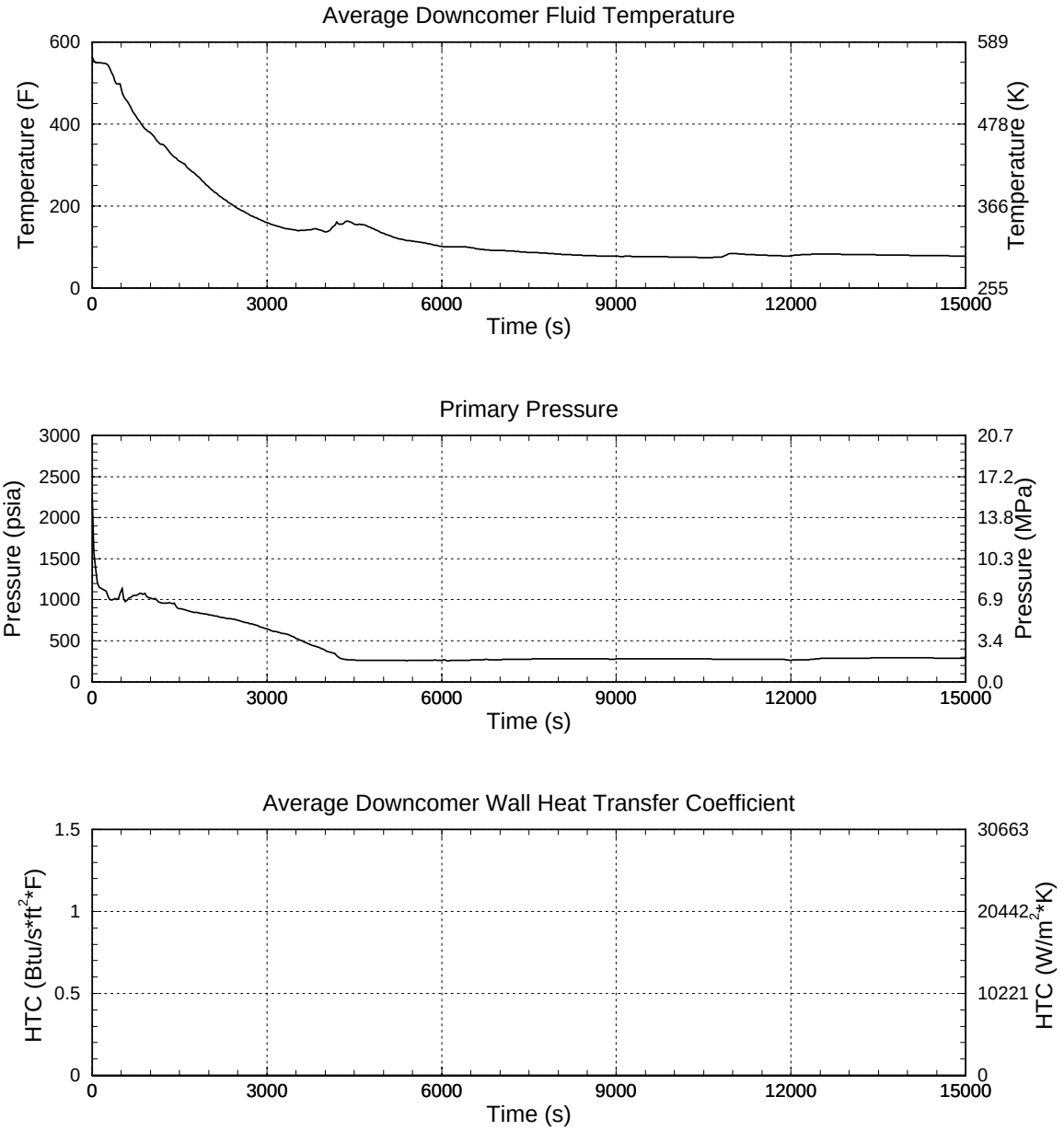


Figure A.2-84: Oconee PTS Results for Case 079

Case Category	LOCA-S
Primary Failures	5.08 cm (2 in) surge line break. No vent valve function.
Secondary Failures	None
Operator Actions	None
Min DC Temp	301.7 K (83.3°F) at 15000 s
Comments	None.

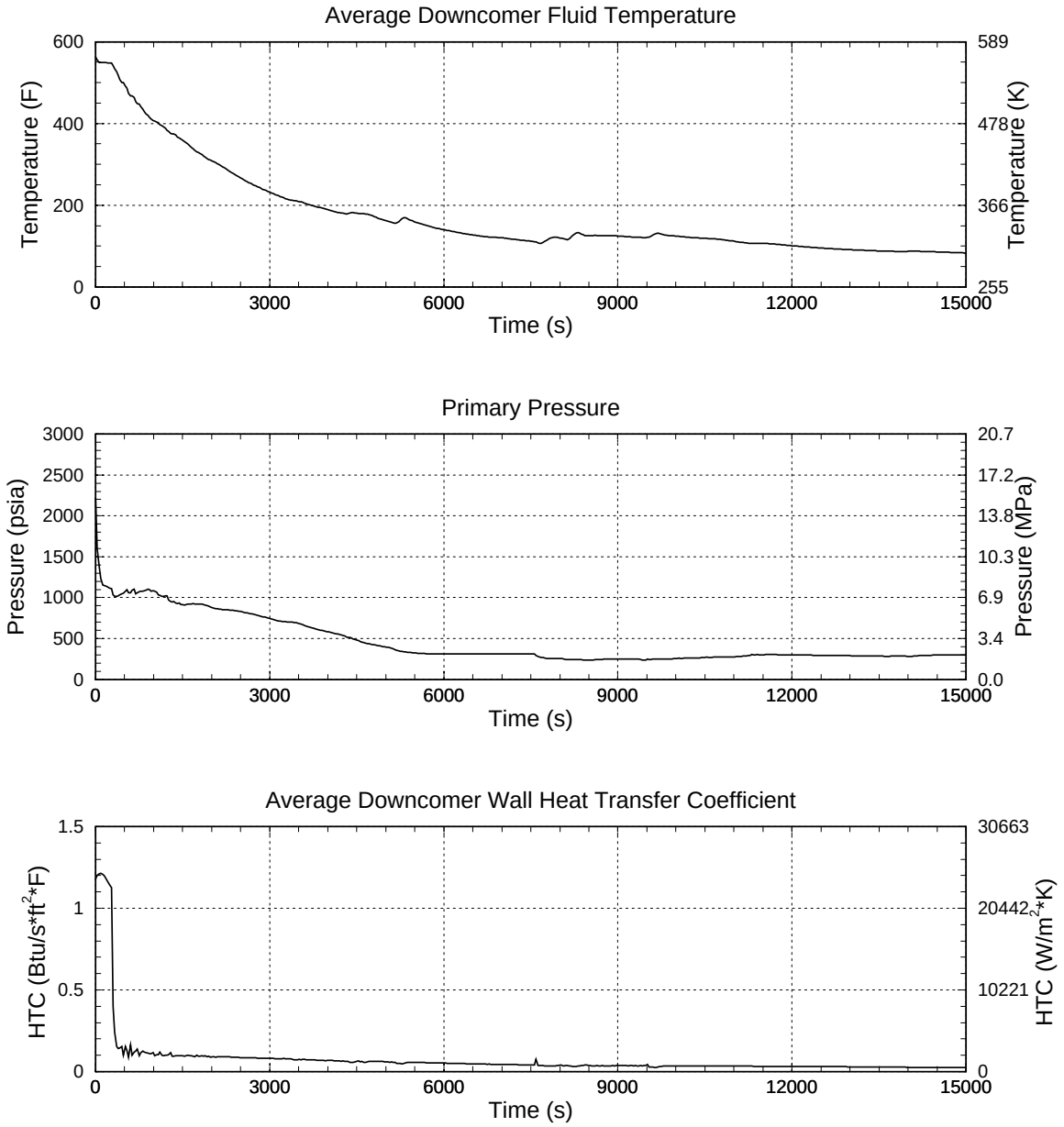


Figure A.2-85: Oconee PTS Results for Case 080

Case Category	LOCA
Primary Failures	5.08 cm (2 inch) surge line break with HPI Failure
Secondary Failures	None
Operator Actions	At 15 minutes after transient initiation, operator opens all TBVs to lower primary system pressure and allow CFT and LPI injection.
Min DC Temp	304.2 K (87.9°F) at 14970 s
Comments	None.

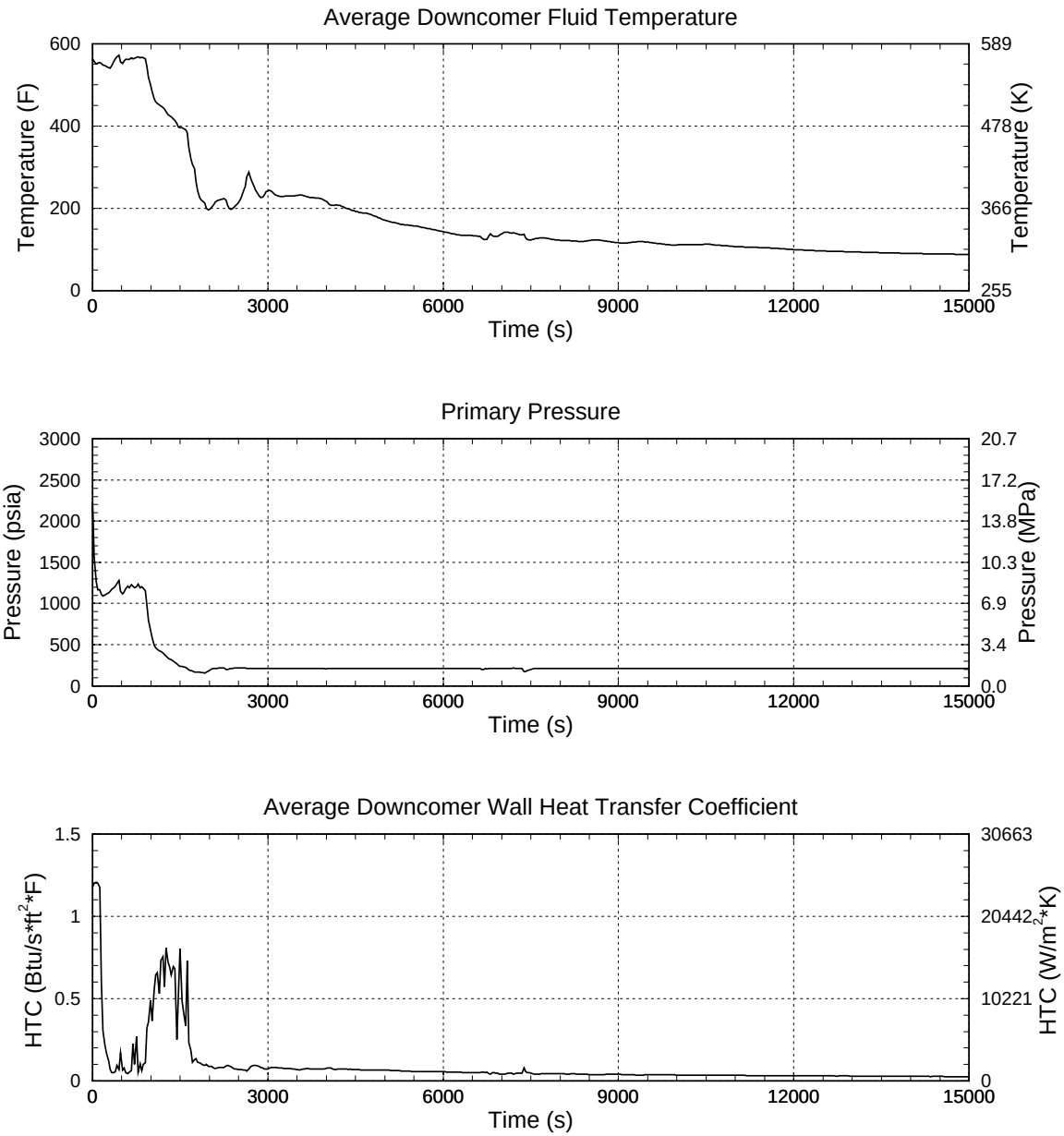


Figure A.2-86: Oconee PTS Results for Case 081

Case Category	LOCA
Primary Failures	2.54 cm (1 in) surge line break with HPI Failure
Secondary Failures	None
Operator Actions	At 15 minutes after initiation, operator opens all TBVs to lower primary pressure and allow CFT and LPI injection. When the CFTs are 50% discharged, HPI is recovered. At 3000 seconds after initiation, operator starts throttling HPI to 55 K (100°F) subcooling and 254 cm (100 in) pressurizer level.
Min DC Temp	367.0 K (200.9°F) at 3000 s
Comments	None.

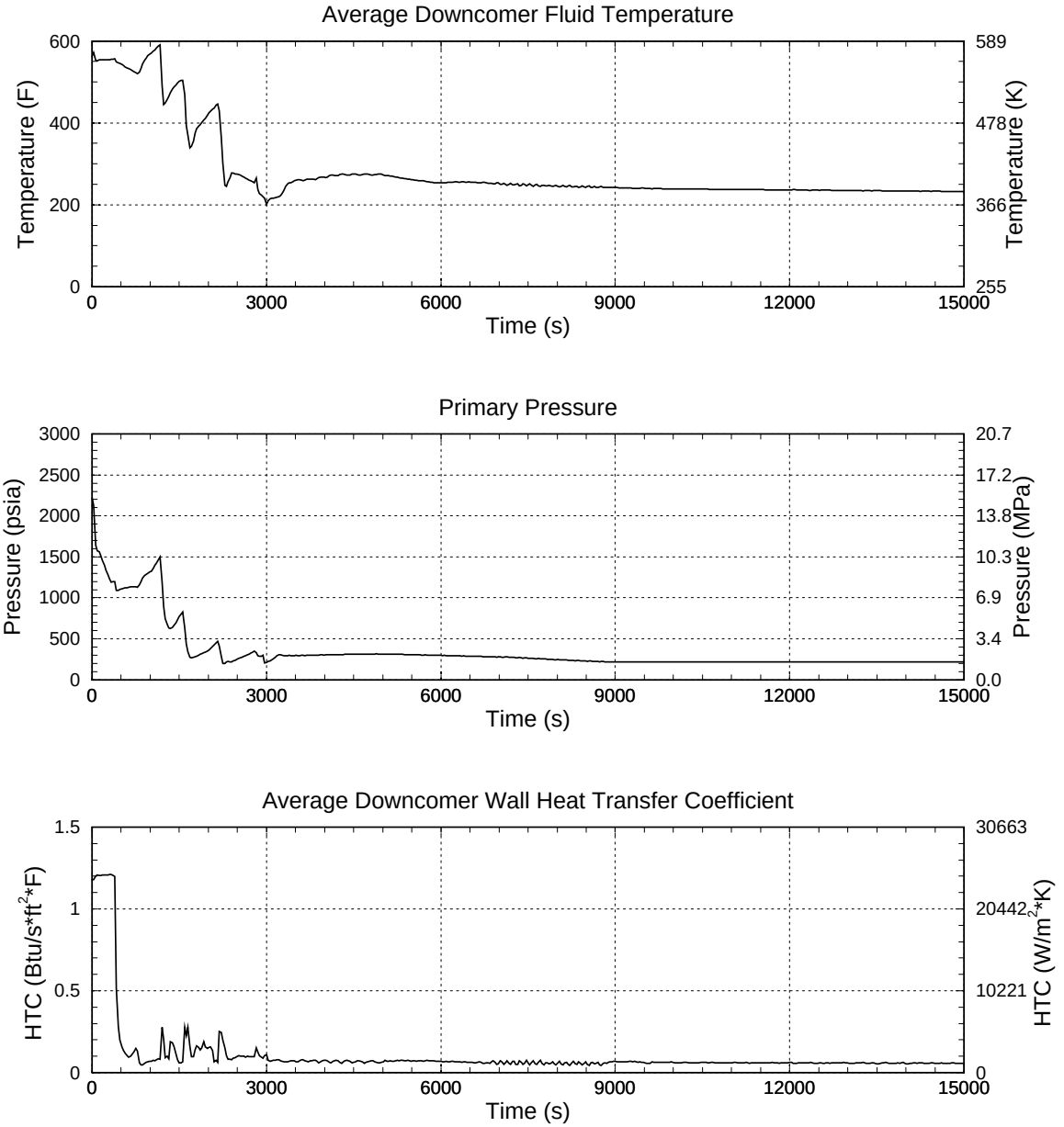


Figure A.2-87: Oconee PTS Results for Case 082

Case Category	TT/RT
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 6000 secs.
Secondary Failures	None
Operator Actions	After valve recloses, operator throttles HPI 1 minute after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling)
Min DC Temp	344.8 K (161.0°F) at 5910 s
Comments	None.

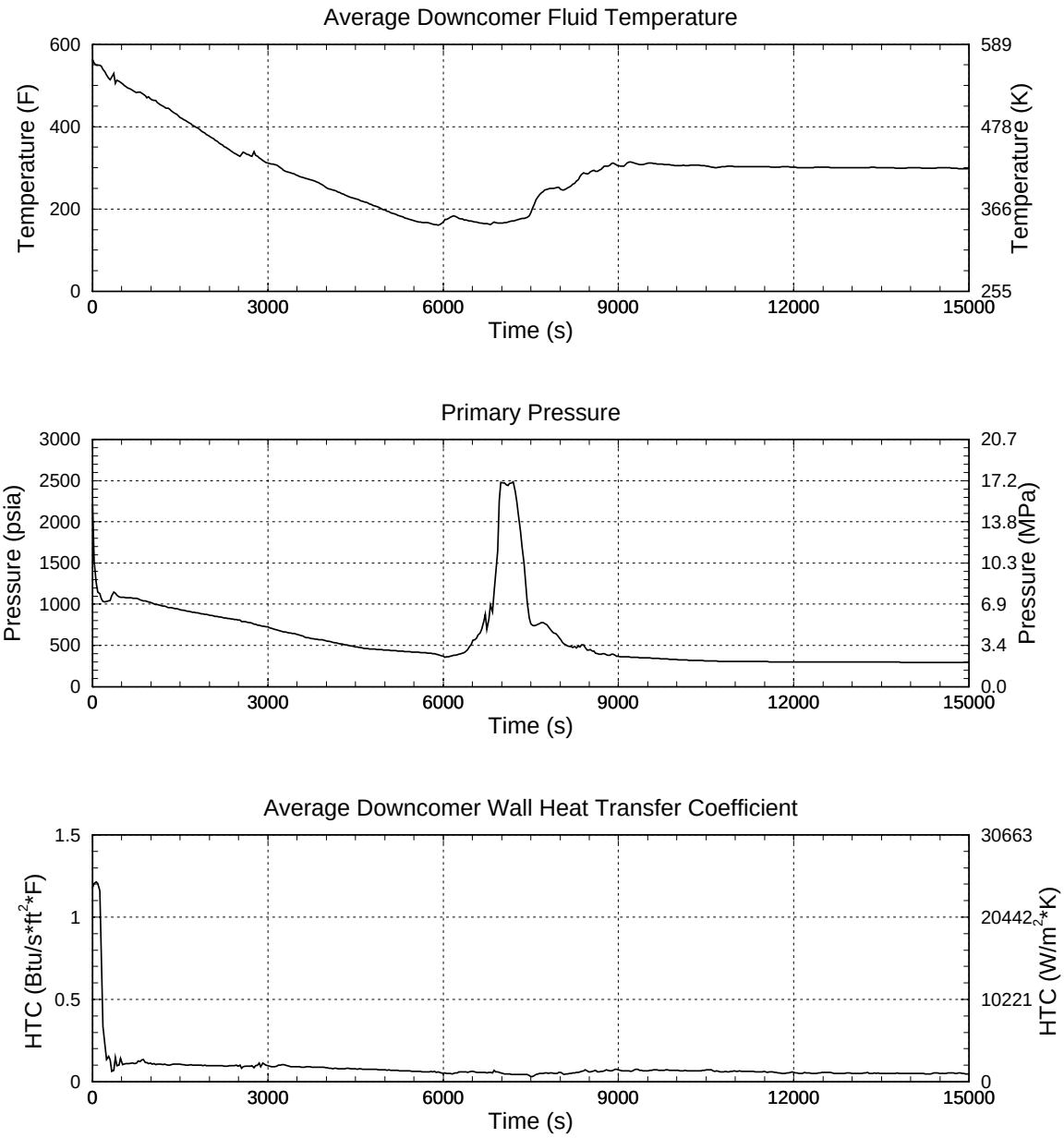


Figure A.2-88: Oconee PTS Results for Case 083

Case Category	TT/RT
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 6000 secs.
Secondary Failures	None
Operator Actions	After valve recloses, operator throttles HPI 10 minutes after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling)
Min DC Temp	344.8 K (161.0°F) at 5910 s
Comments	None.

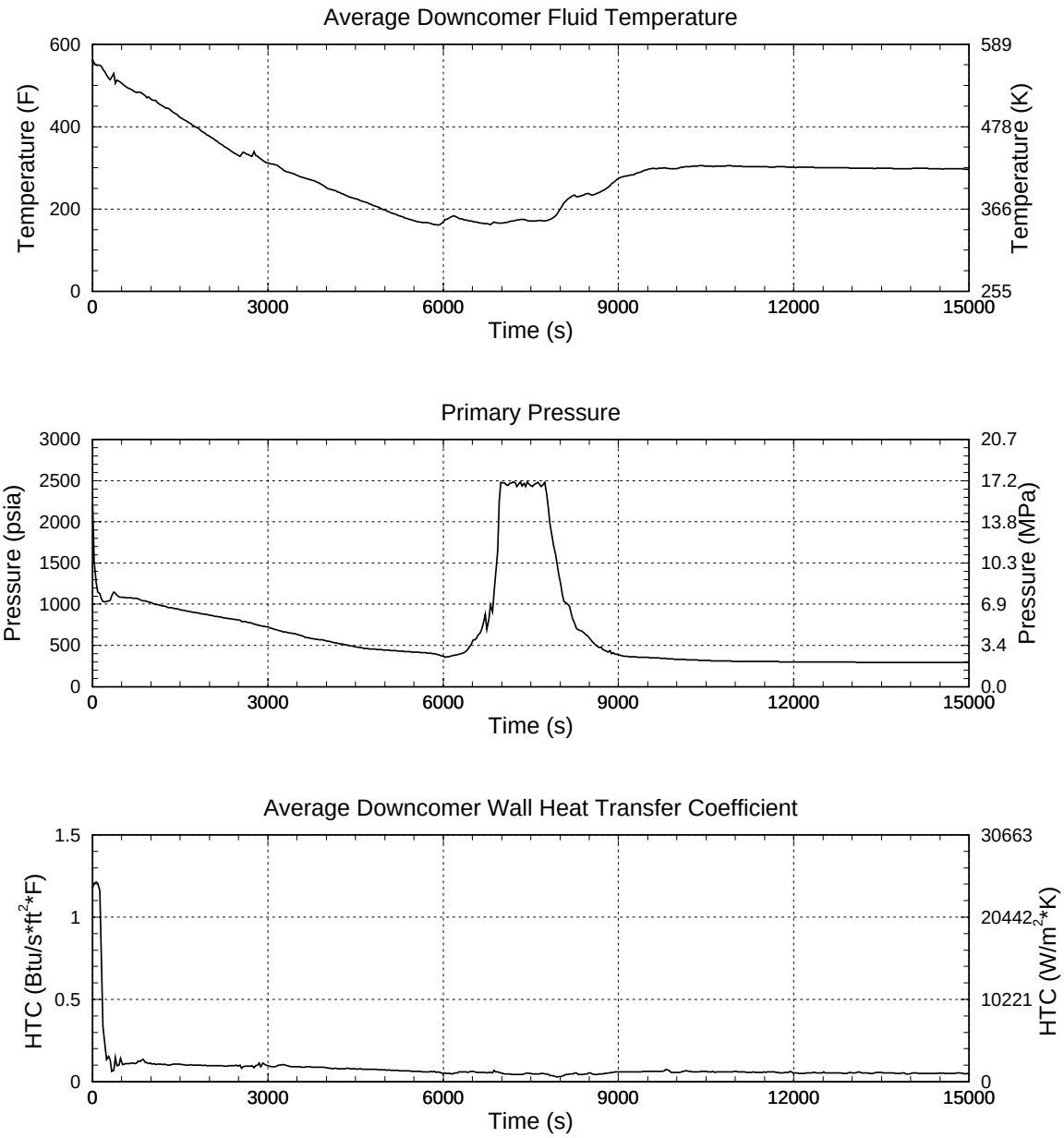


Figure A.2-89: Oconee PTS Results for Case 084

Case Category	TT/RT
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 3000 secs.
Secondary Failures	None
Operator Actions	After valve recloses, operator throttles HPI 1 minute after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling)
Min DC Temp	407.5 K (273.9°F) at 3540 s
Comments	None.

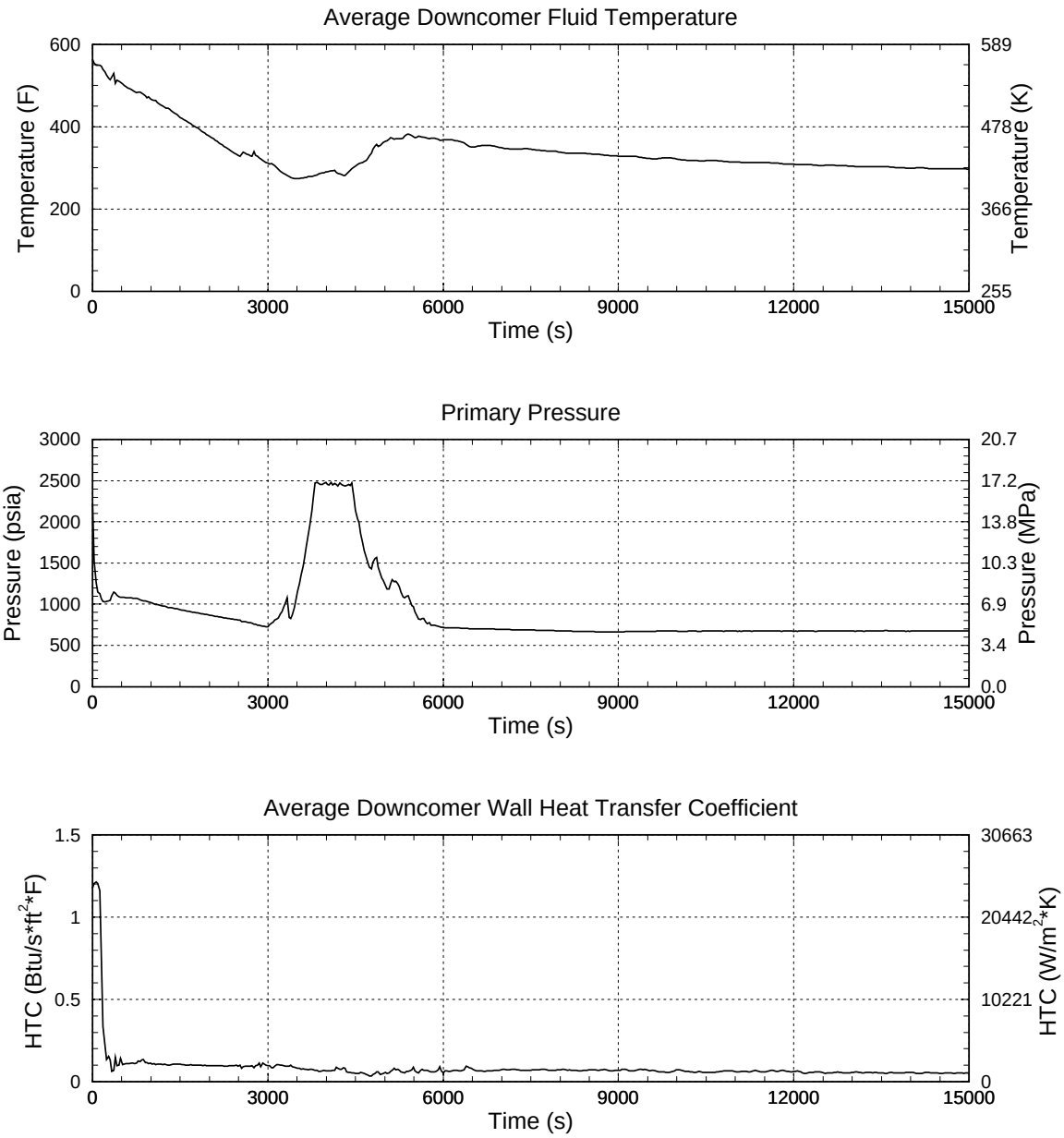


Figure A.2-90: Oconee PTS Results for Case 085

Case Category	TT/RT
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 3000 secs.
Secondary Failures	None
Operator Actions	After valve recloses, operator throttles HPI 10 minutes after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling)
Min DC Temp	407.5 K (273.9°F) at 3540 s
Comments	None.

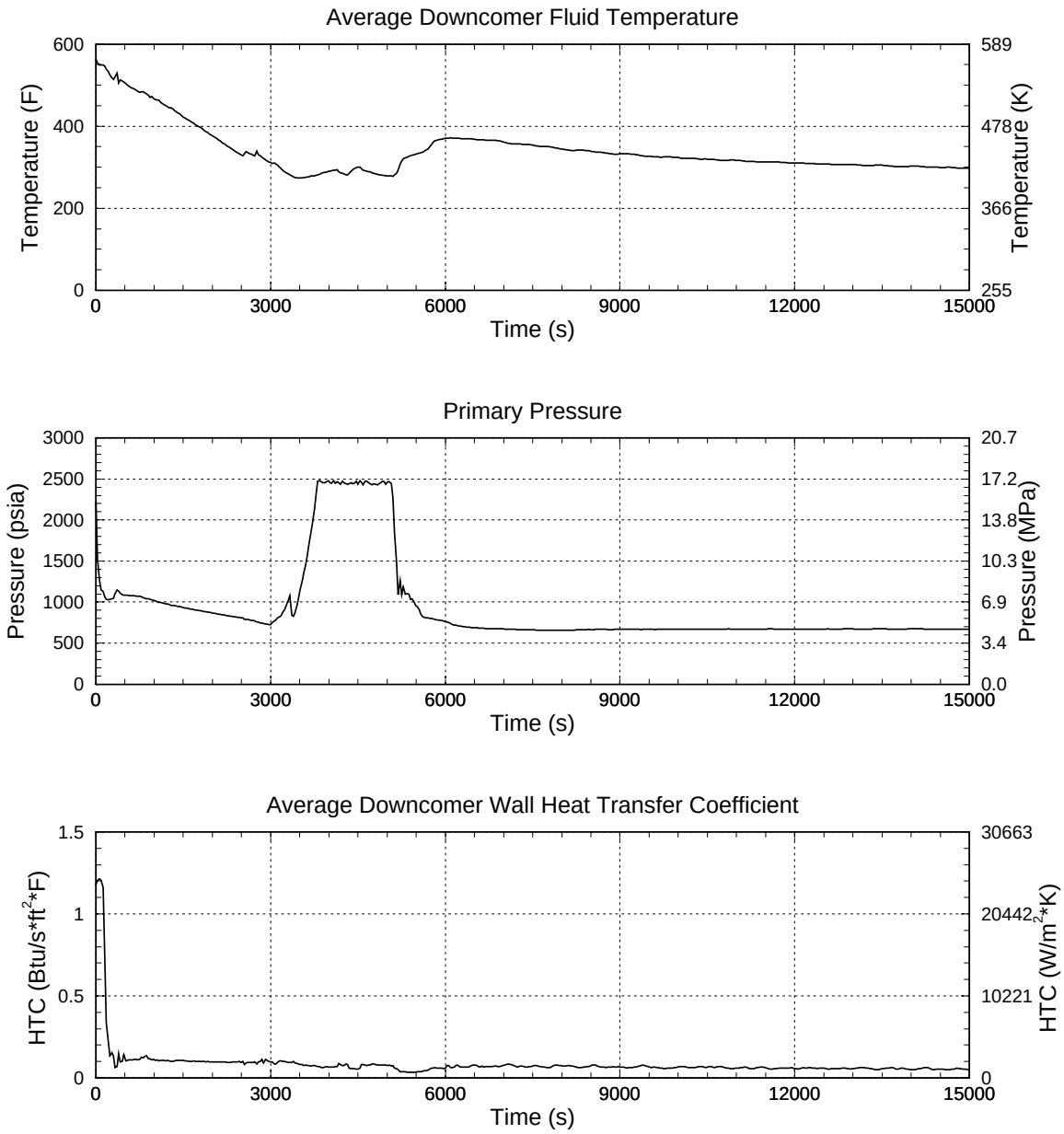


Figure A.2-91: Oconee PTS Results for Case 086

Case Category	TT/RT
Primary Failures	Stuck open pressurizer SRV and HPI Failure
Secondary Failures	None
Operator Actions	At 15 minutes after initiation, operator opens all TBVs to lower primary pressure and allow CFT and LPI injection. When the CFTs are 50% discharged, HPI is recovered. The HPI is throttled 20 minutes after 5°F subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	299.0 K (78.5°F) at 15000 s
Comments	None.

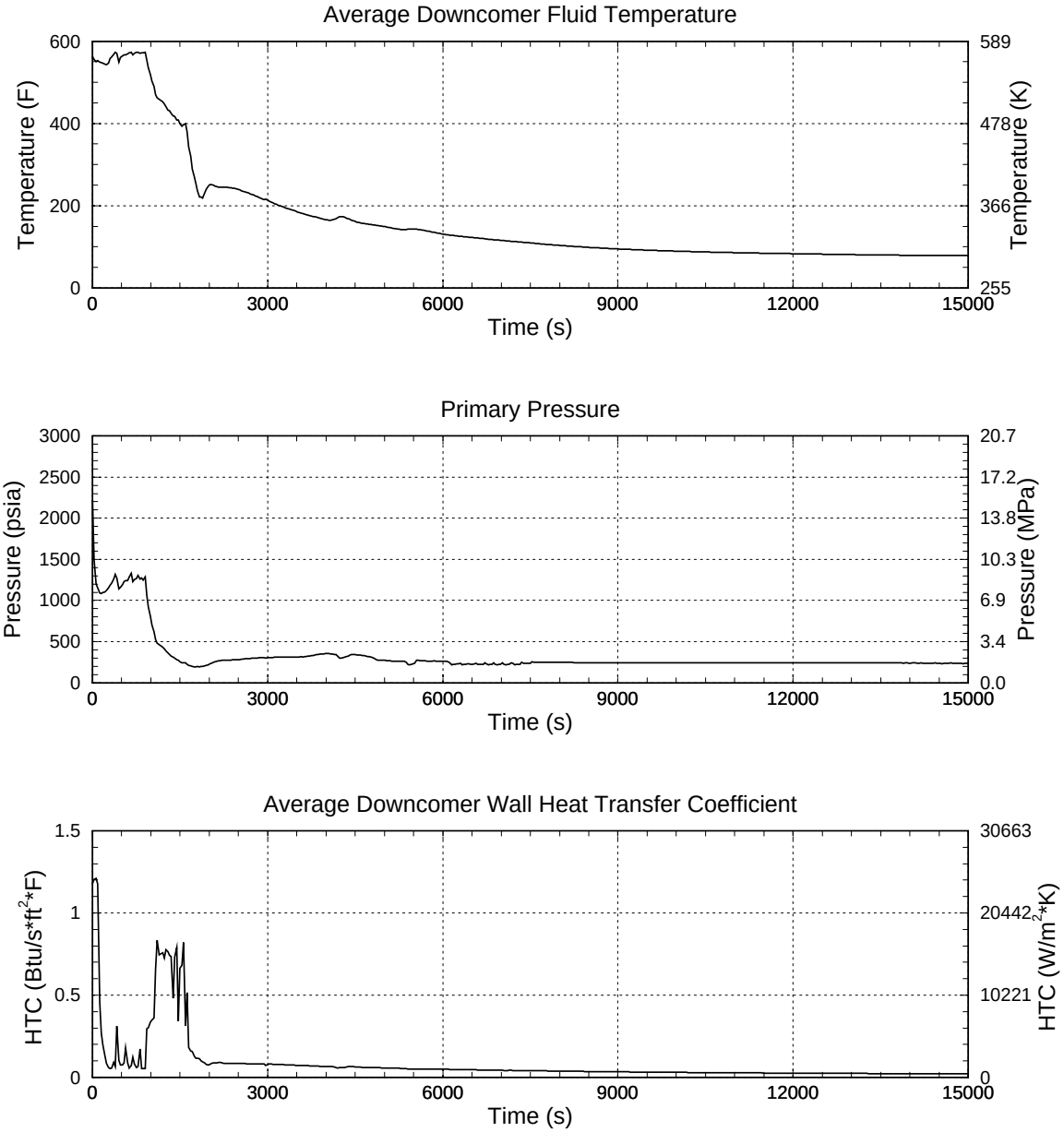


Figure A.2-92: Oconee PTS Results for Case 087

Case Category	TT/RT
Primary Failures	Stuck open pressurizer safety valve and HPI Failure
Secondary Failures	None
Operator Actions	At 15 minutes after initiation, operator opens all TBVs to lower primary pressure and allow CFT and LPI injection. When the CFTs are 50% discharged, HPI is recovered. The SRV is closed 5 minutes after HPI recovered. HPI is throttled at 1 minute after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	376.9 K (218.8°F) at 1860 s
Comments	None.

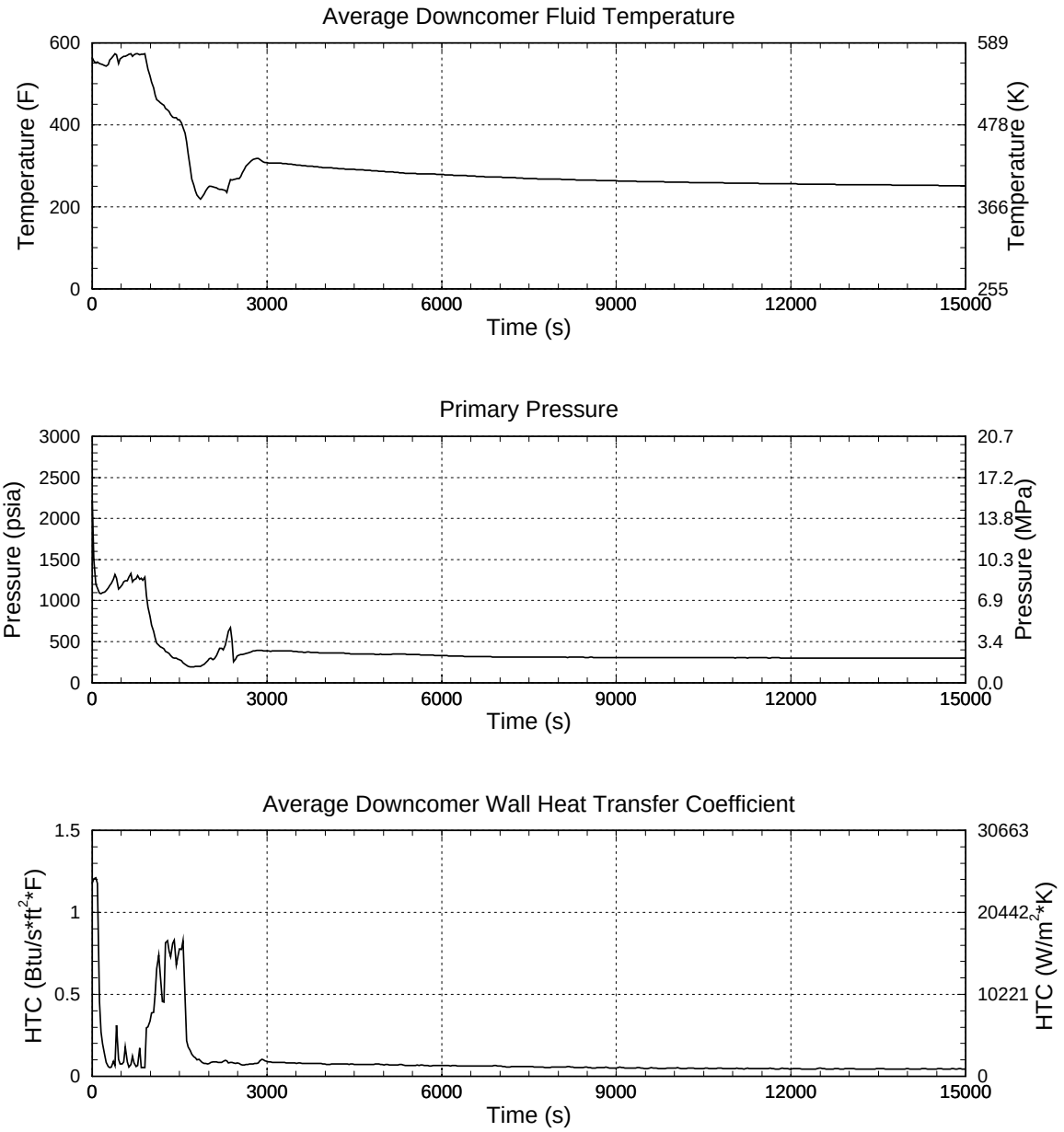


Figure A.2-93: Oconee PTS Results for Case 088

Case Category	TT/RT
Primary Failures	None
Secondary Failures	Loss of MFW and EFW.
Operator Actions	Opens all TBVs to depressurize the secondary side so the condensate booster pumps feed the SGs. Booster pumps are assumed to be initially uncontrolled so that the SGs are overfilled (609 cm (240 in) startup level). Controls booster pump flow to maintain SG level at 76 cm (30 in) due to continued RCP operation. Throttles HPI to maintain 55 K (100°F) subcooling and a pressurizer level of 254 cm (100 in). The TBVs are kept fully opened due to operator error.
Min DC Temp	413.3 K (284.3°F) at 14970 s
Comments	None.

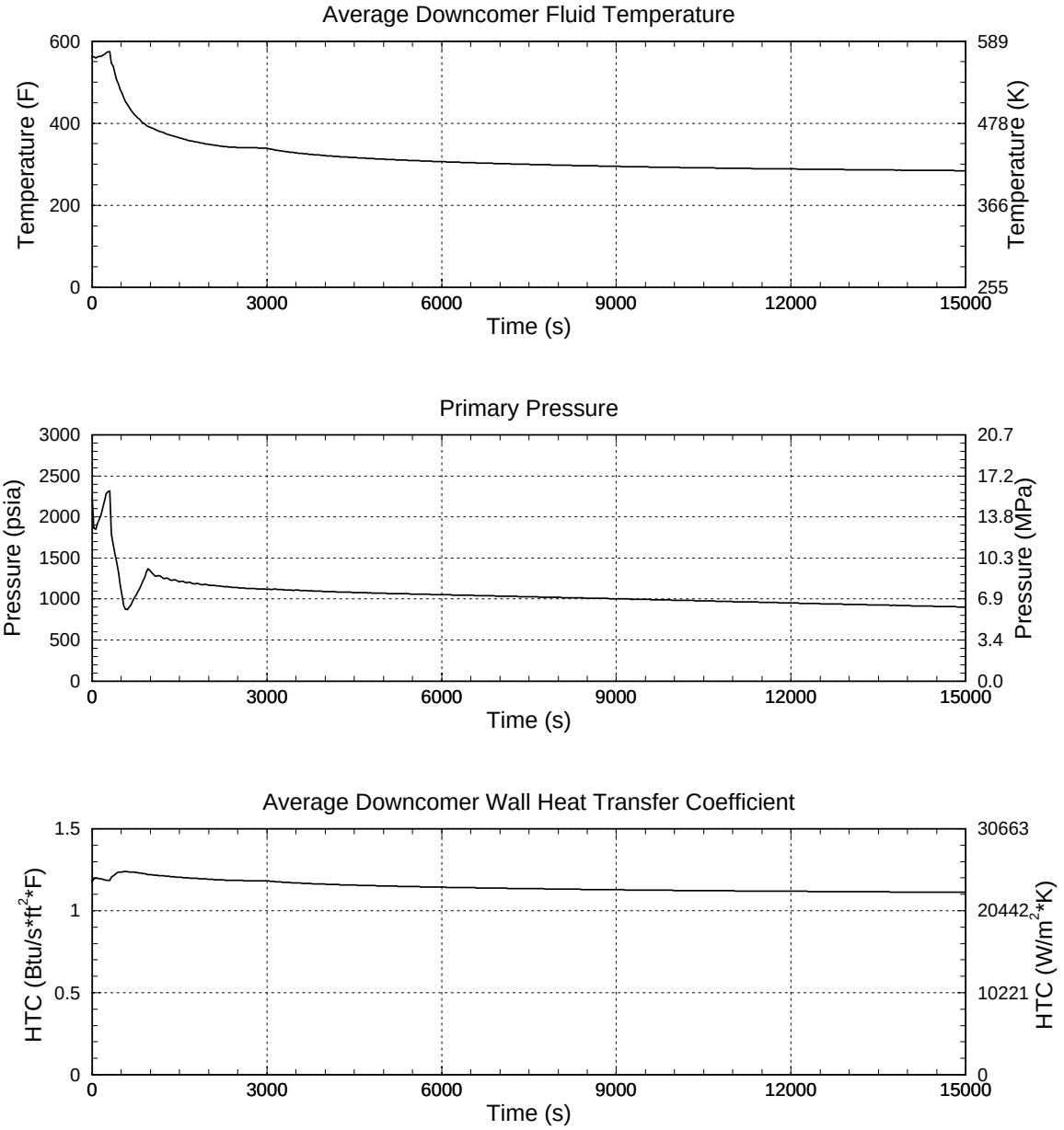


Figure A.2-94: Oconee PTS Results for Case 089

Case Category	TT/RT
Primary Failures	None
Secondary Failures	2 stuck open safety valves in SG-A
Operator Actions	Operator throttles HPI 20 minutes after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	443.7 K (339.0°F) at 14940 s
Comments	None.

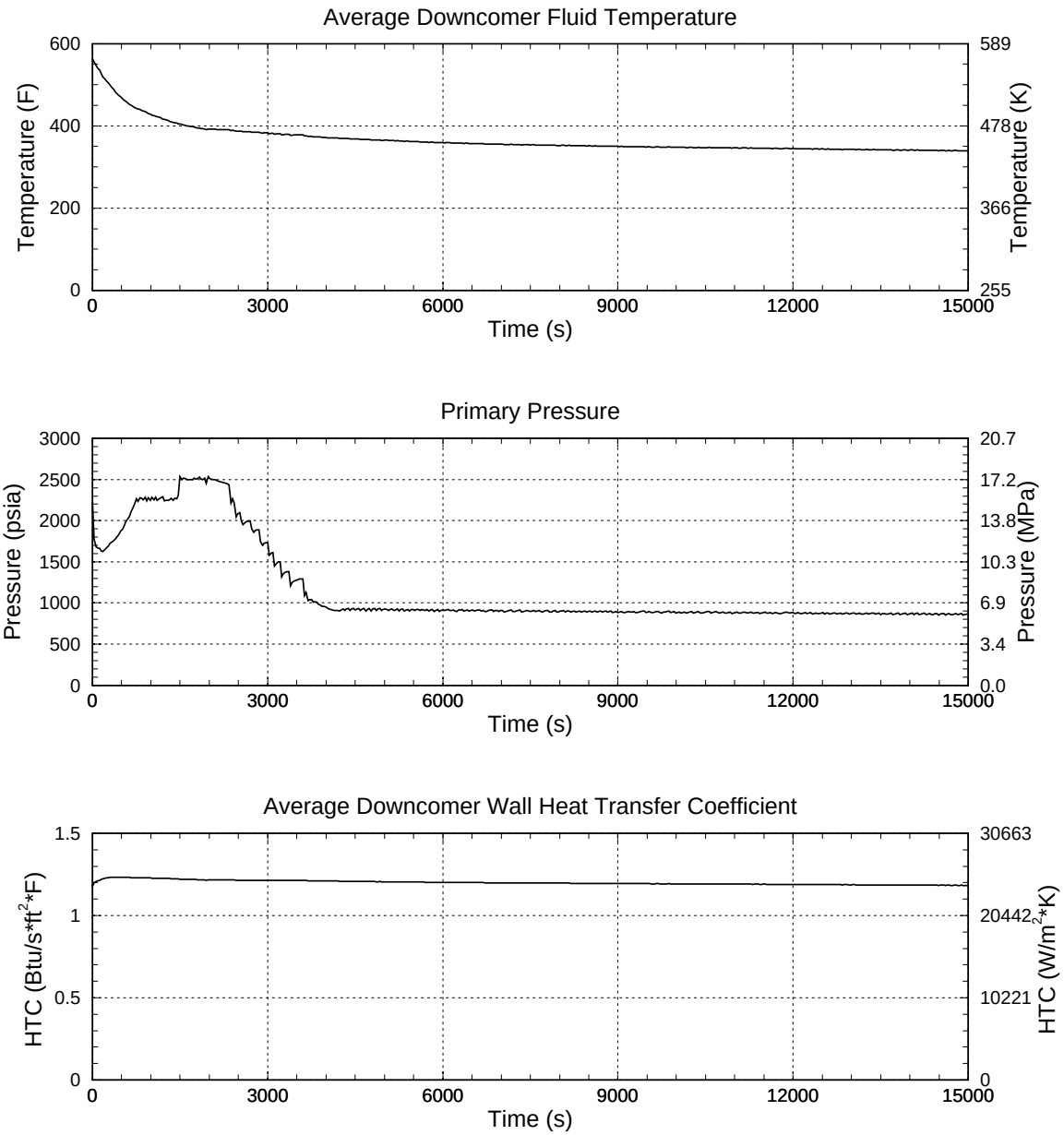


Figure A.2-95: Oconee PTS Results for Case 090

Case Category	SGTR
Primary Failures	None
Secondary Failures	SGTR with a stuck open SRV in SG-B. A reactor trip is assumed to occur at the time of the tube rupture. Stuck safety relief valve is assumed to reclose 10 minutes after initiation.
Operator Actions	Operator trips RCP's 1 minute after initiation. Operator also throttles HPI 10 minutes after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (assumed throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	483.8 K (411.3°F) at 720 s
Comments	None.

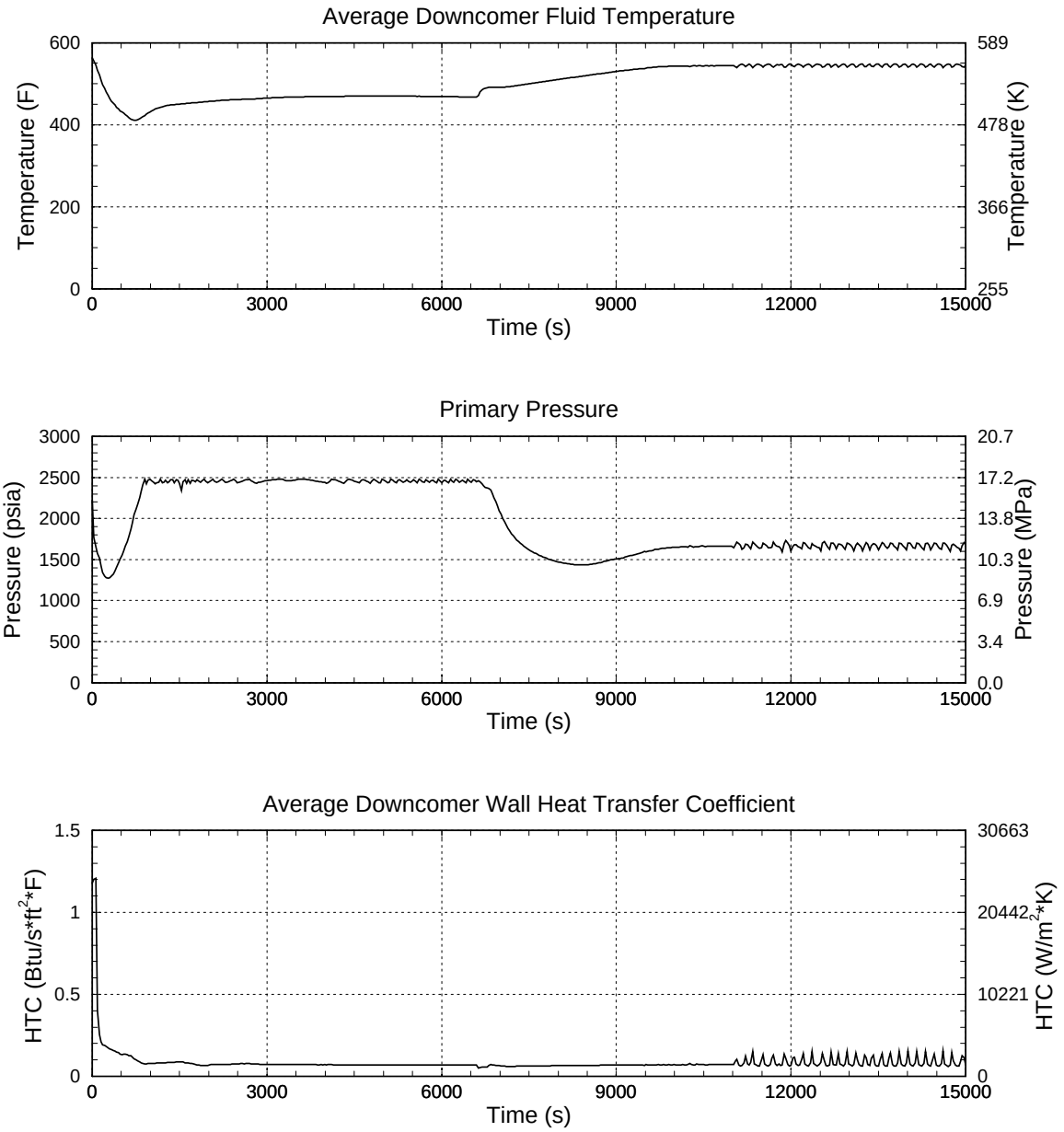


Figure A.2-96: Oconee PTS Results for Case 091

Case Category	TT/RT-HZP
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 6000 secs .
Secondary Failures	None
Operator Actions	After valve recloses, operator throttles HPI at 1 minute after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	331.5 K (137.1°F) at 5400 s
Comments	None.

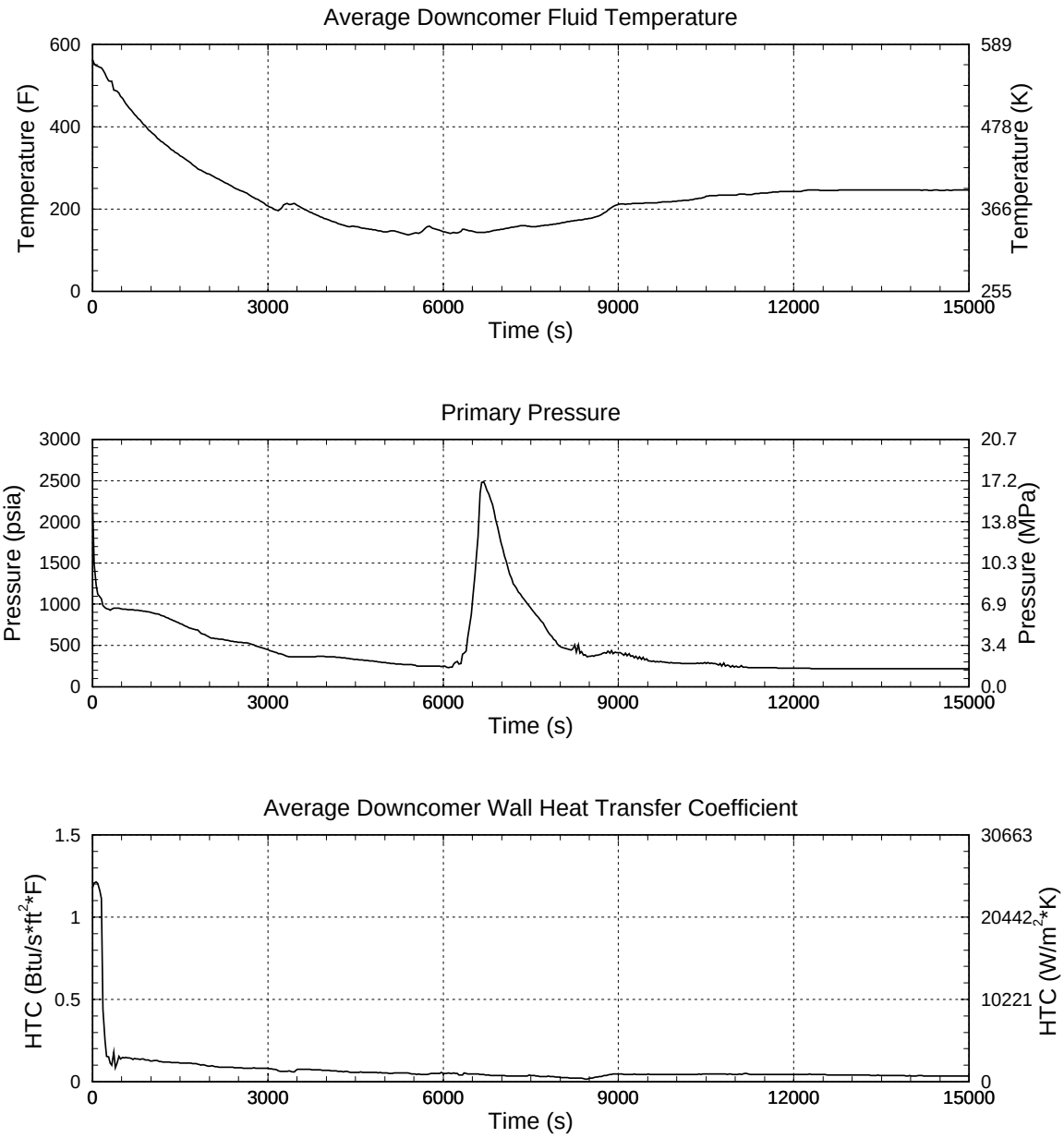


Figure A.2-97: Oconee PTS Results for Case 092

Case Category	TT/RT-HZP
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 6000 secs.
Secondary Failures	None
Operator Actions	After valve recloses, operator throttles HPI at 10 minutes after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	331.5 K (137.1°F) at 5400 s
Comments	None.

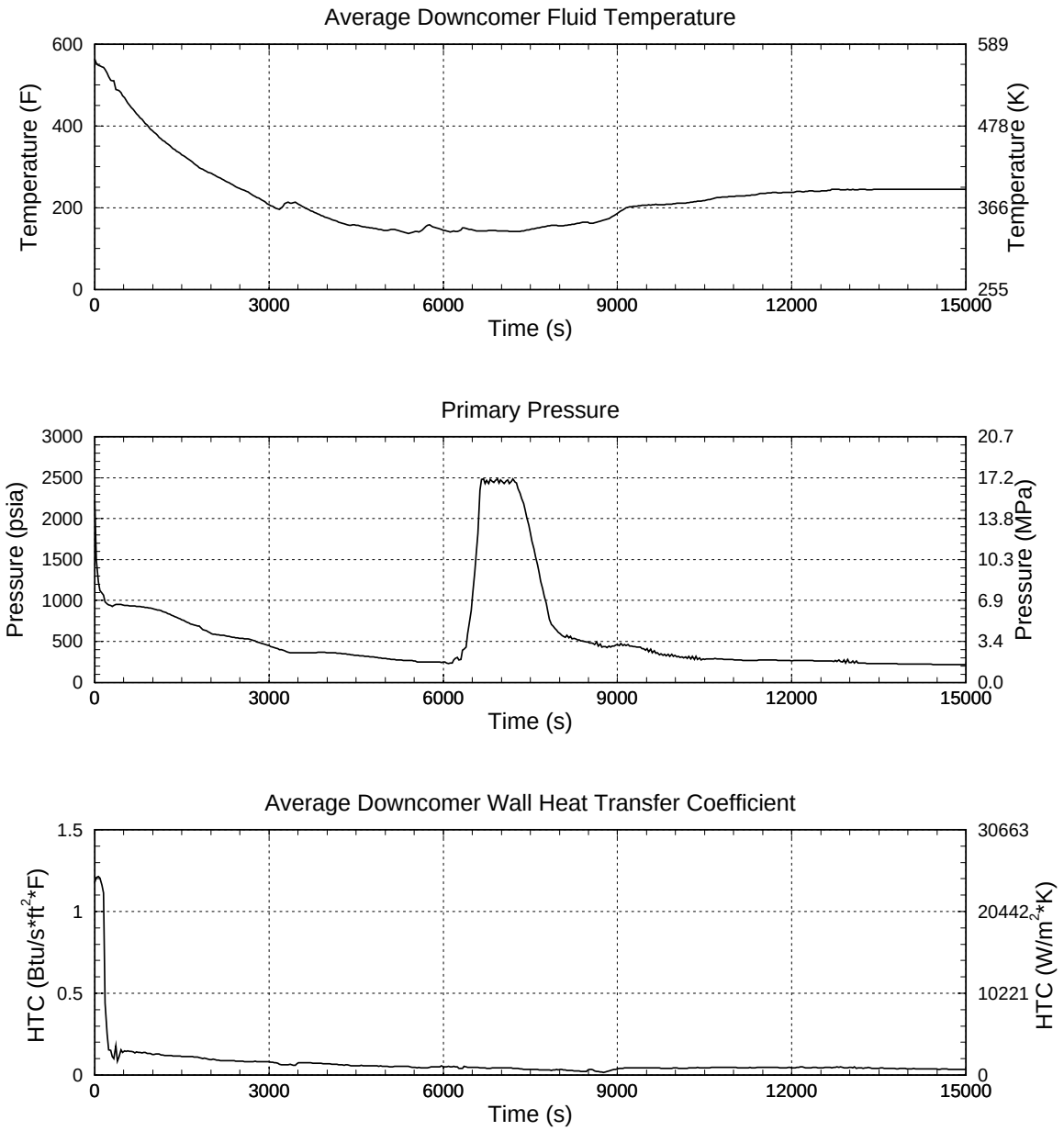


Figure A.2-98: Oconee PTS Results for Case 093

Case Category	TT/RT-HZP
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 3000 secs.
Secondary Failures	None
Operator Actions	After valve recloses, operator throttles HPI at 1 minute after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	353.4 K (176.5°F) at 4050 s
Comments	None.

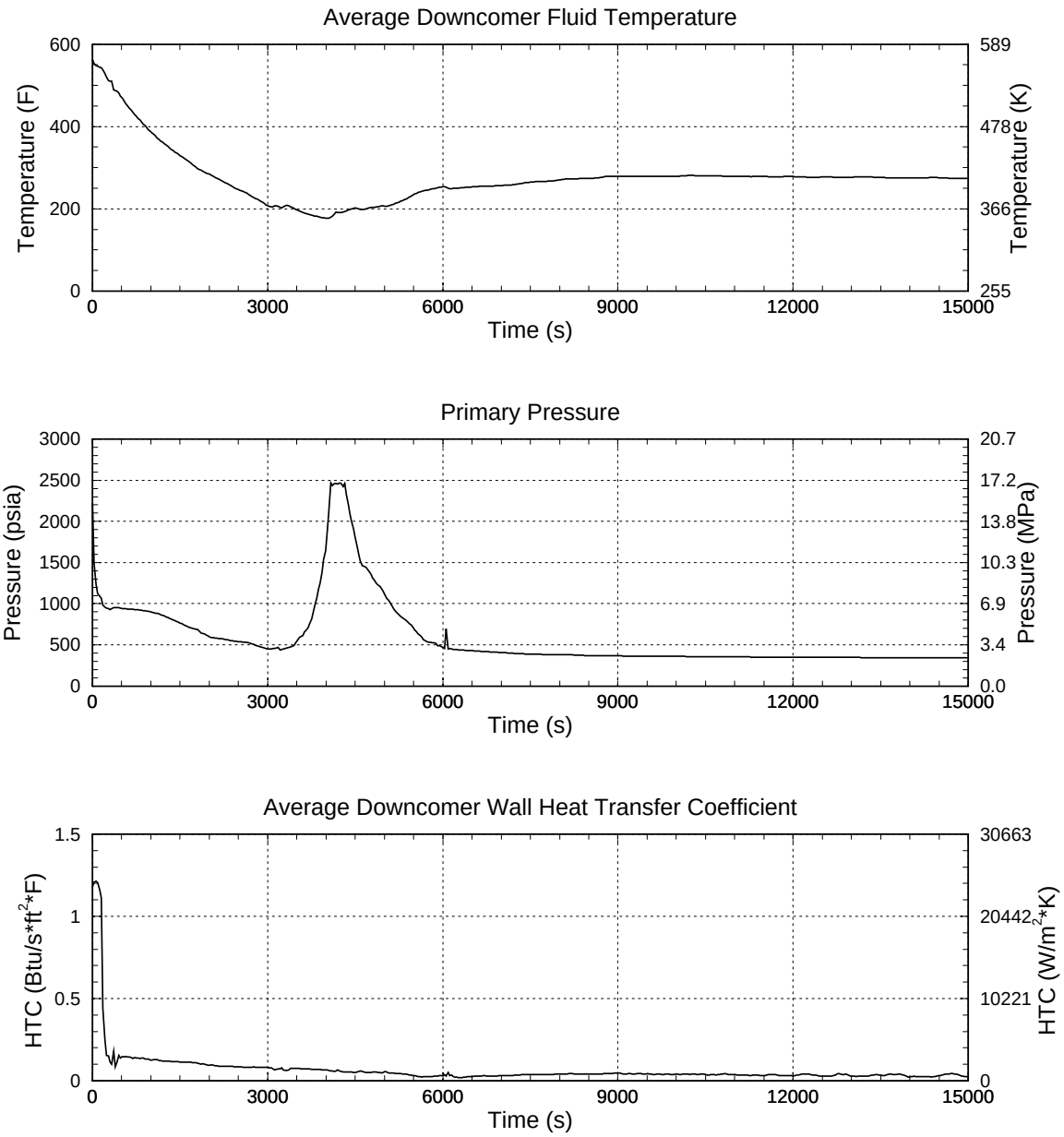


Figure A.2-99: Oconee PTS Results for Case 094

Case Category	TT/RT-HZP
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 3000 secs.
Secondary Failures	None
Operator Actions	After valve recloses, operator throttles HPI at 10 minutes after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	353.4 K (176.5°F) at 4050 s
Comments	None.

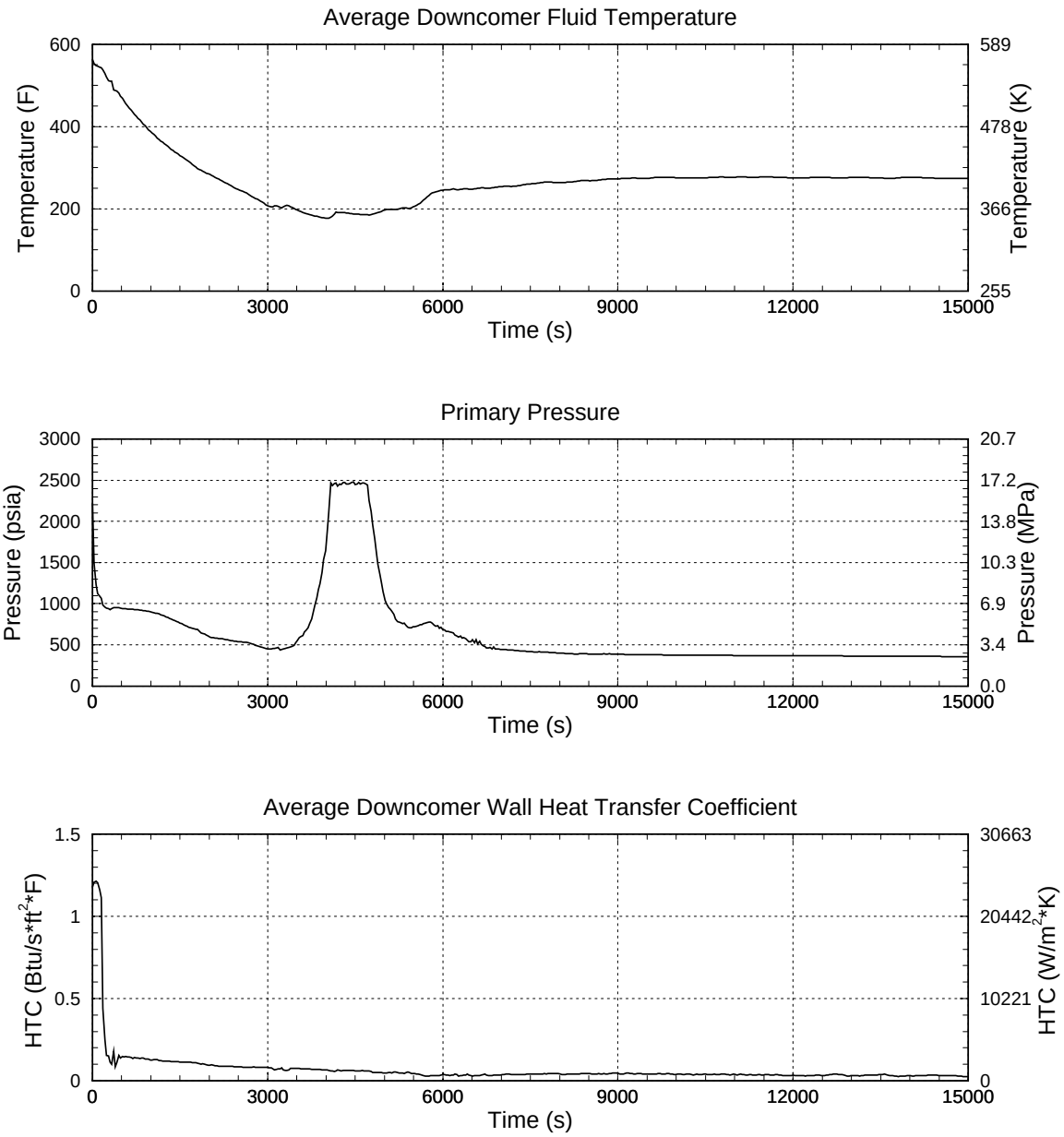


Figure A.2-100: Oconee PTS Results for Case 095

Case Category	TT/RT-HZP
Primary Failures	Stuck open pressurizer safety valve and HPI Failure
Secondary Failures	None
Operator Actions	At 15 minutes after initiation, operator opens all TBVs to lower primary pressure and allow CFT and LPI injection. When the CFTs are 50% discharged, HPI is recovered. HPI is throttled 20 minutes after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	297.3 K (75.4°F) at 15000 s
Comments	None.

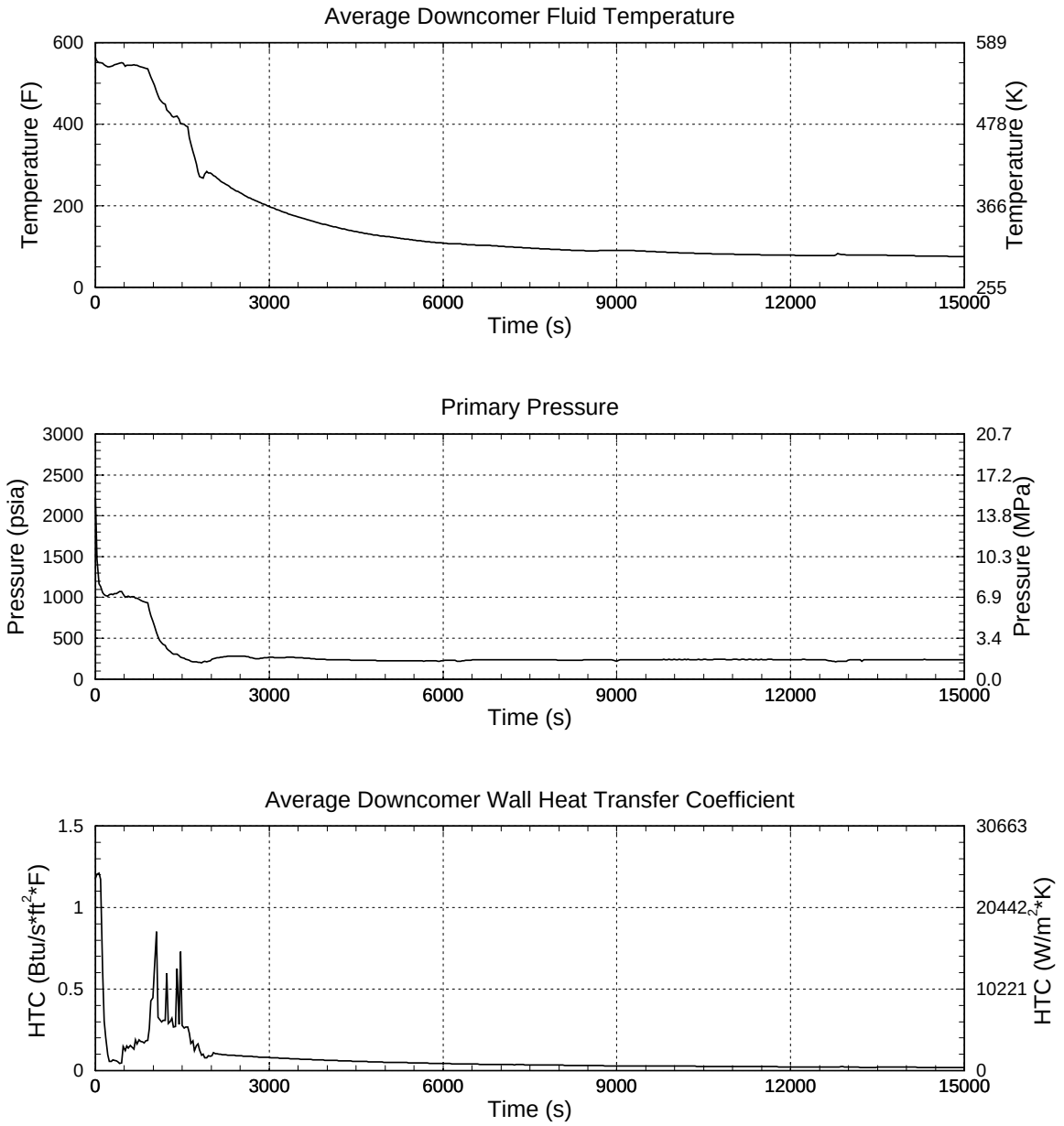


Figure A.2-101: Oconee PTS Results for Case 096

Case Category	TT/RT-HZP
Primary Failures	Stuck open pressurizer SRV and HPI Failure
Secondary Failures	None
Operator Actions	At 15 minutes after initiation, operator opens all TBVs to lower primary pressure and allow CFT and LPI injection. When the CFTs are 50% discharged, HPI is recovered. SRV is closed at 5 minutes after HPI is recovered. HPI is throttled at 1 minute after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	381.5 K (227.1°F) at 15000 s
Comments	None.

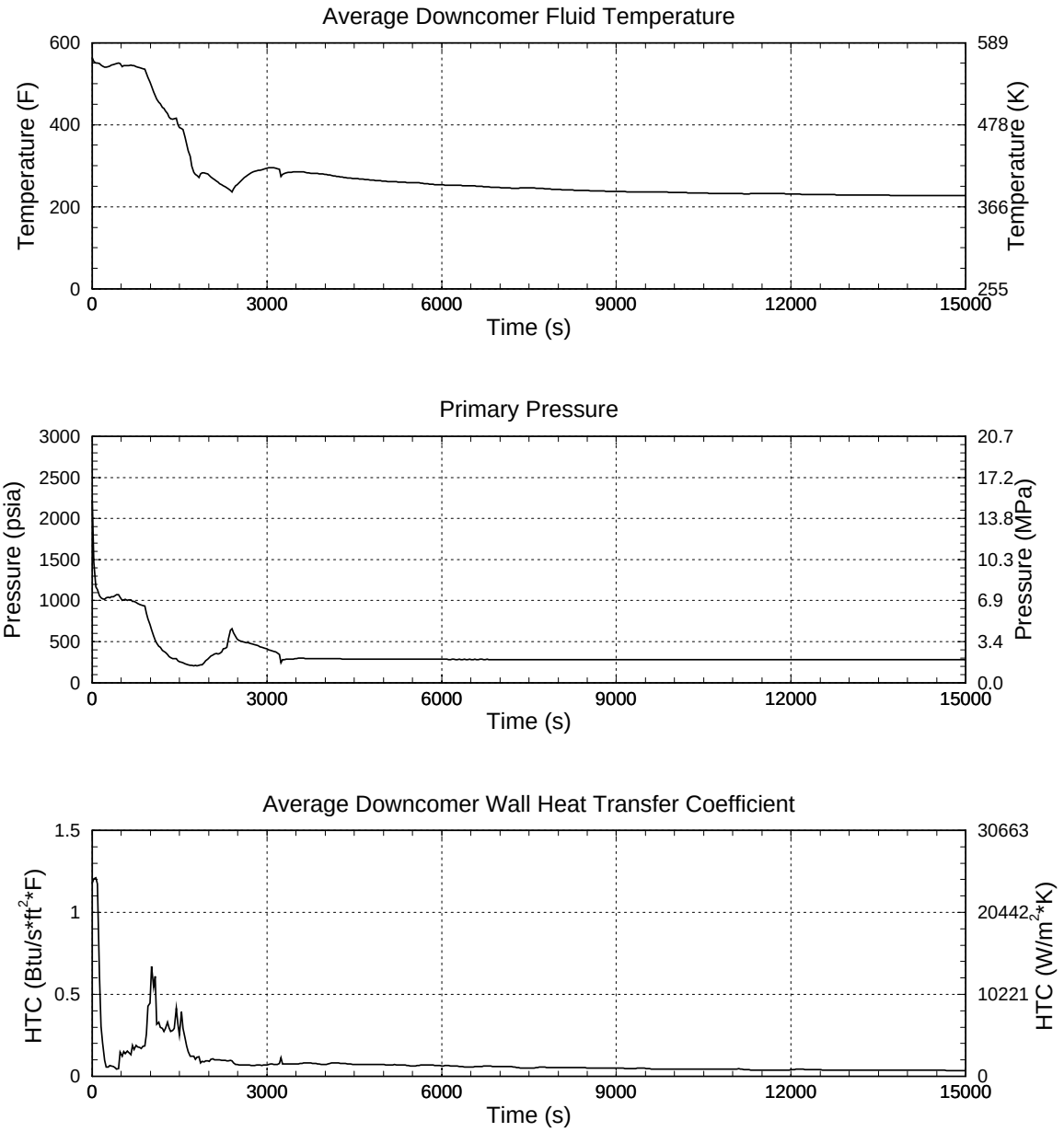


Figure A.2-102: Oconee PTS Results for Case 097

Case Category	TT/RT-HZP
Primary Failures	None
Secondary Failures	Loss of MFW and EFW.
Operator Actions	Opens all TBVs to depressurize the secondary side so the condensate booster pumps feed the SGs. Booster pumps are assumed to be initially uncontrolled so that the SGs are overfilled (610 cm (240 in) startup level). Controls booster pump flow to maintain SG level at 76 cm (30 in) due to continued RCP operation. Throttles HPI to maintain 55 K (100°F) subcooling and a pressurizer level of 254 cm (100 in). The TBVs are kept fully opened due to operator error.
Min DC Temp	402.4 K (264.6°F) at 14970 s
Comments	None.

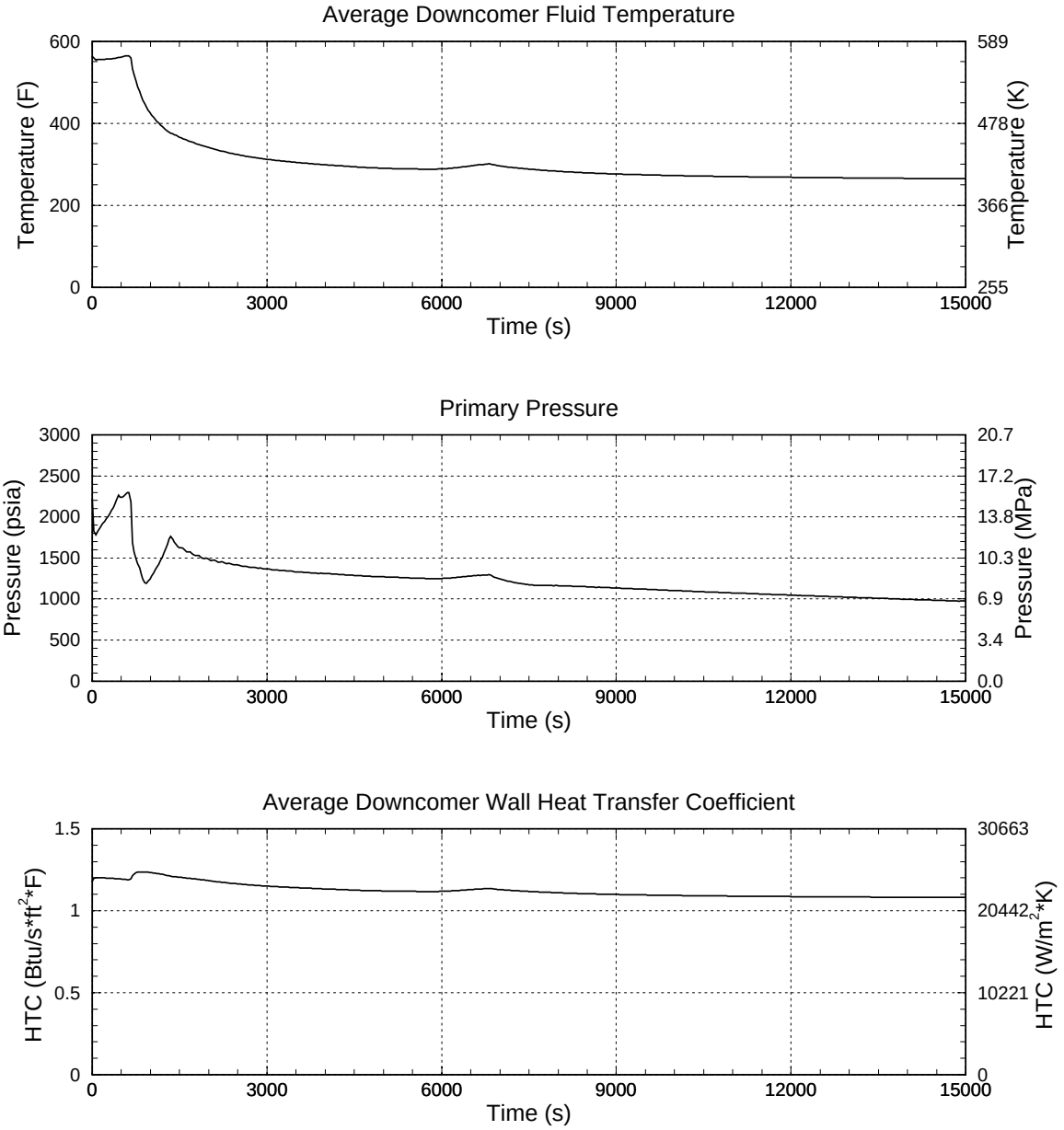


Figure A.2-103: Oconee PTS Results for Case 098

Case Category	MSLB
Primary Failures	None
Secondary Failures	MSLB with trip of turbine driven EFW by MSLB Circuitry.
Operator Actions	HPI is throttled 20 minutes after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	379.6 K (223.6°F) at 9750 s
Comments	None.

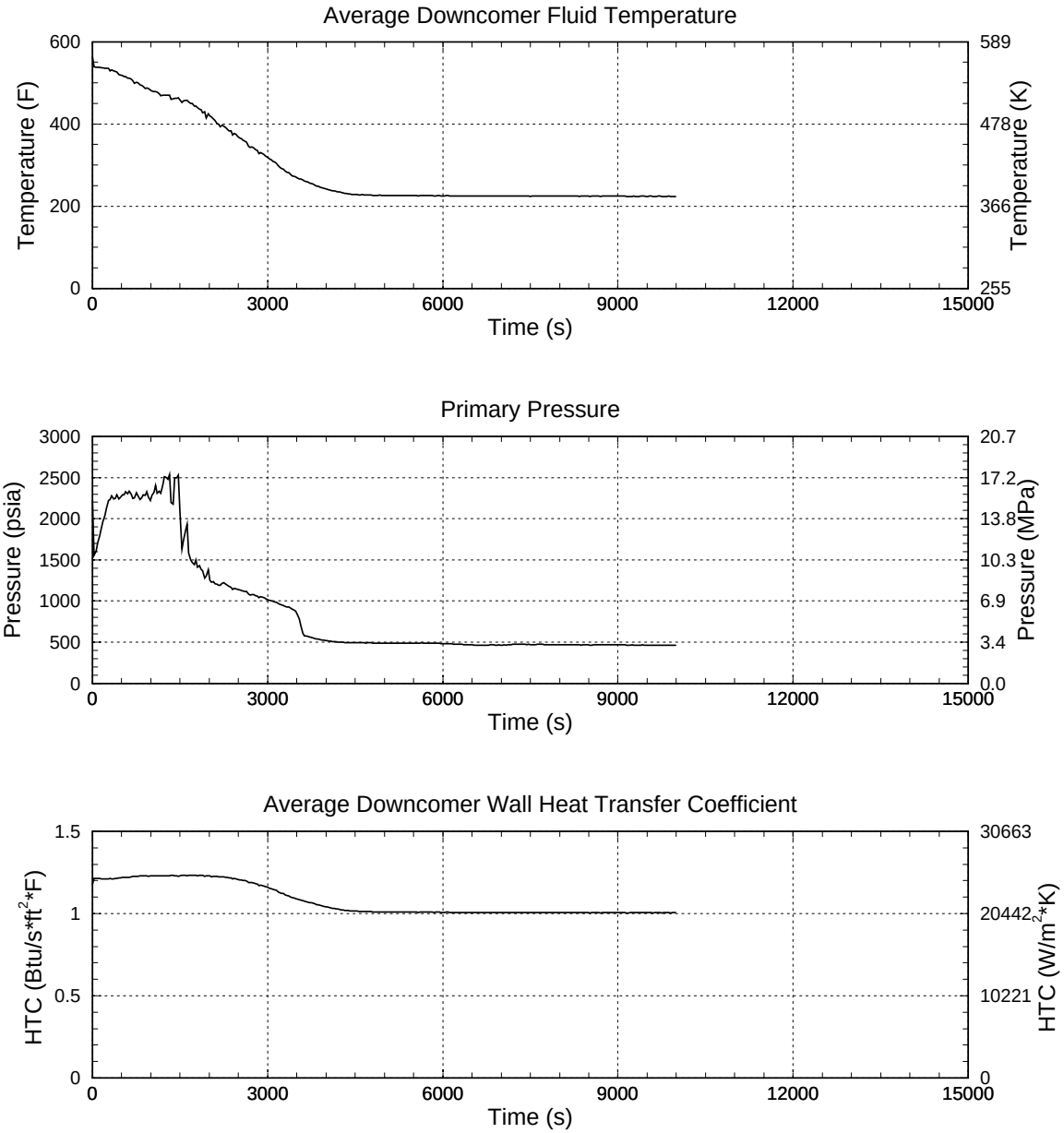


Figure A.2-104: Oconee PTS Results for Case 099

Case Category	MSLB-HZP
Primary Failures	None
Secondary Failures	MSLB with trip of turbine driven EFW by MSLB Circuitry
Operator Actions	Operator throttles HPI 20 minutes after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	377.8 K (220.4°F) at 8280 s
Comments	None.

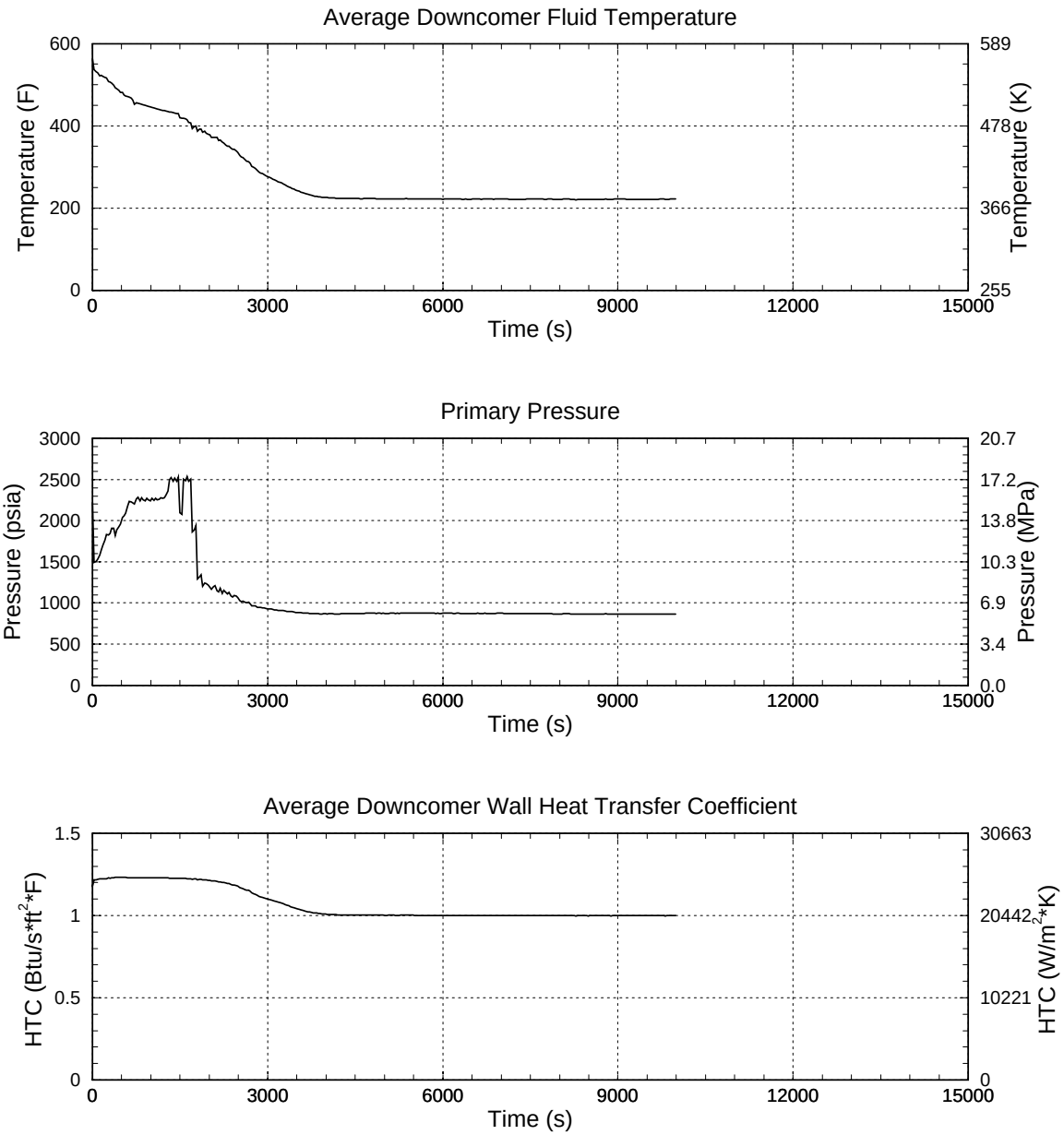


Figure A.2-105: Oconee PTS Results for Case 100

Case Category	MSLB-HZP
Primary Failures	None
Secondary Failures	MSLB without trip of turbine driven EFW by MSLB Circuitry
Operator Actions	Operator throttles HPI to maintain 27.8 K (50°F) subcooling margin (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	377.5 K (219.8°F) at 13110 s
Comments	None.

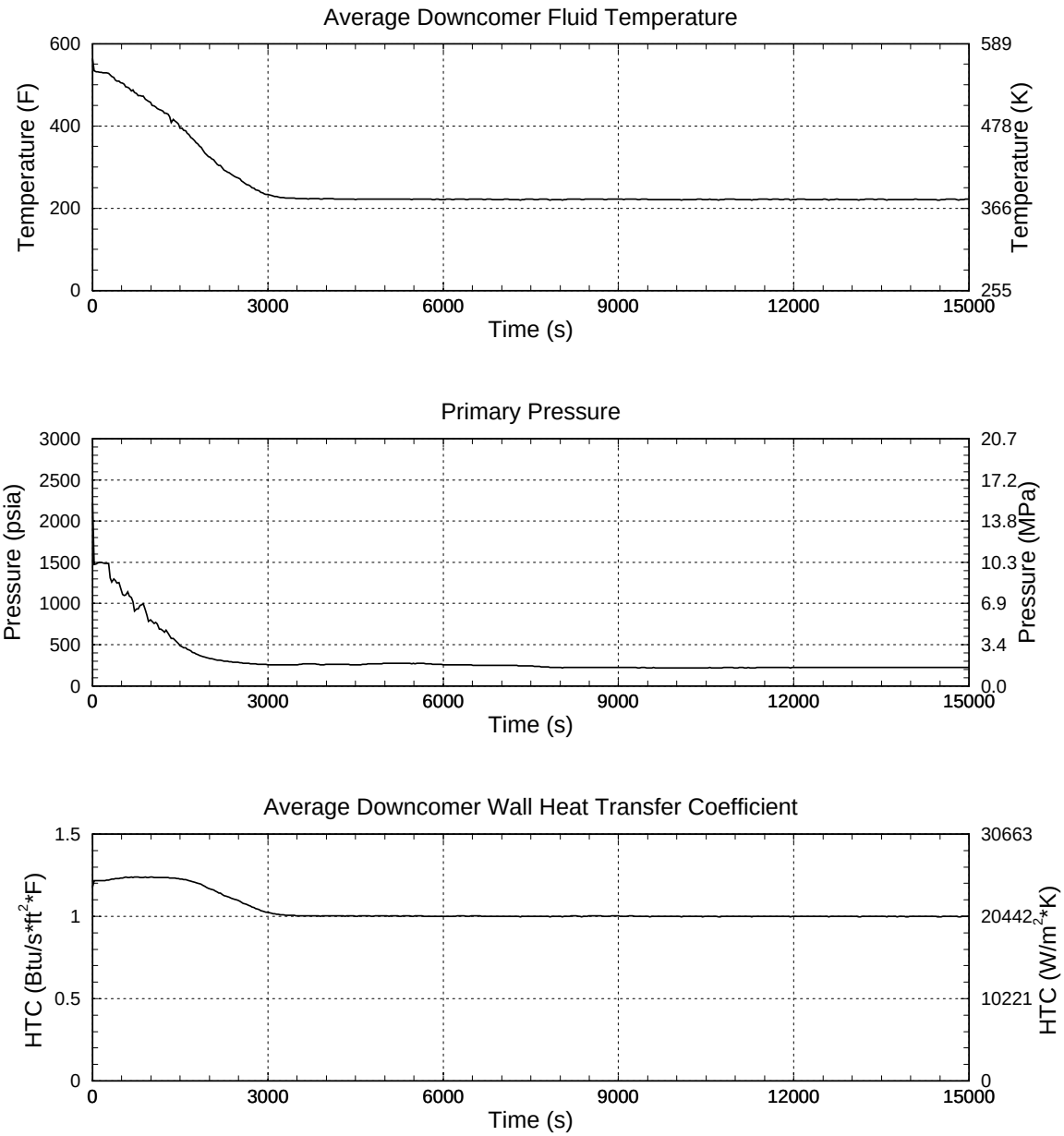


Figure A.2-106: Oconee PTS Results for Case 101

Case Category	TT/RT-HZP
Primary Failures	None
Secondary Failures	2 stuck open safety valves in SG-A
Operator Actions	Operator throttles HPI 20 minutes after 2.77 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27 K (50°F) subcooling).
Min DC Temp	430.7 K (315.7°F) at 14730 s
Comments	None.

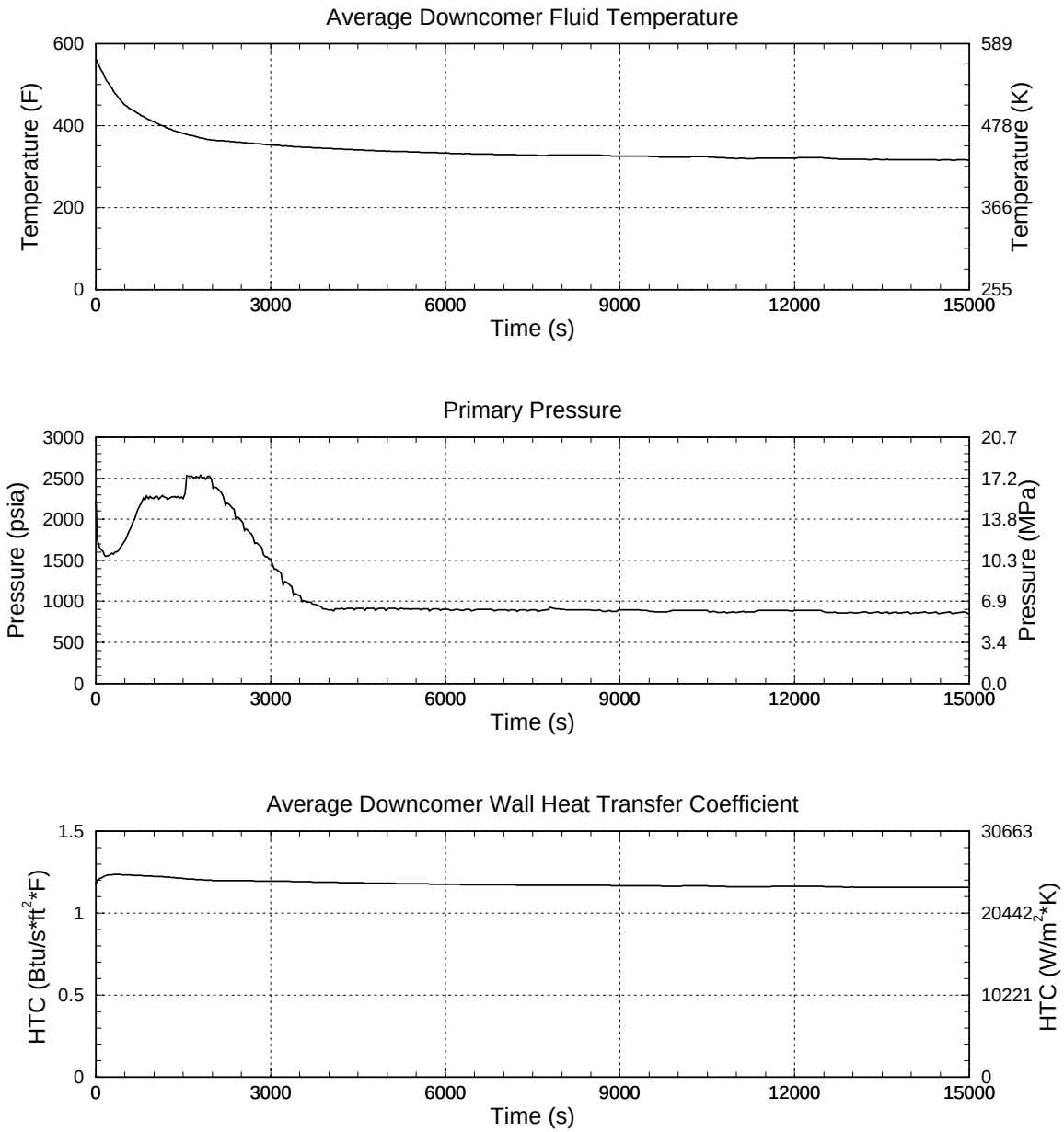


Figure A.2-107: Oconee PTS Results for Case 102

Case Category	SGTR-HZP
Primary Failures	None
Secondary Failures	SGTR with a stuck open SRV in SG-B. A reactor trip is assumed to occur at the time of the tube rupture. Stuck safety relief valve is assumed to reclose 10 minutes after initiation.
Operator Actions	Operator trips RCP's 1 minute after initiation. Operator also throttles HPI 10 minutes after 2.77 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27 K (50°F) subcooling).
Min DC Temp	438.9 K (330.3°F) at 6600 s
Comments	None.

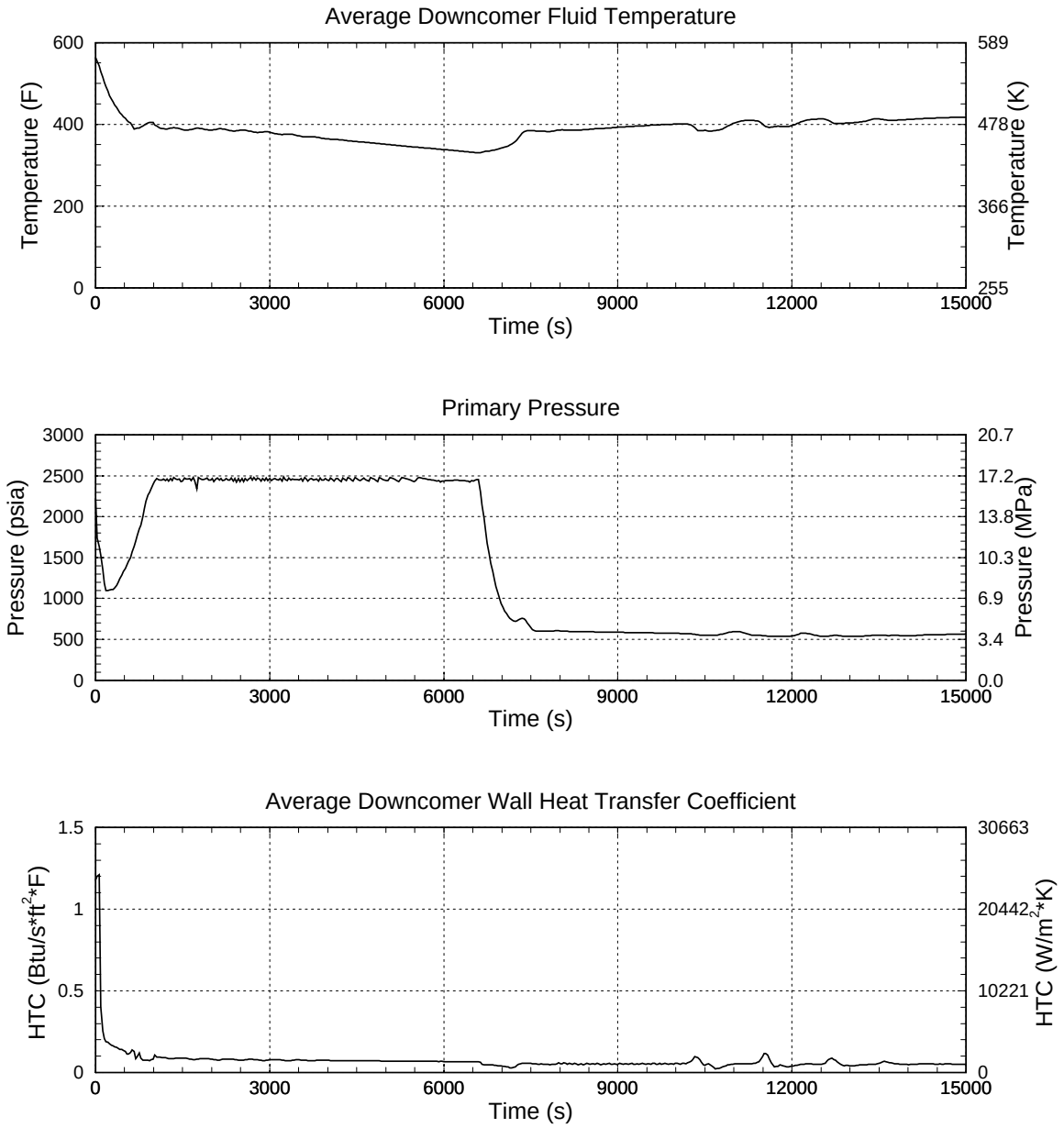


Figure A.2-108: Oconee PTS Results for Case 103

Case Category	LOCA-HZP
Primary Failures	3.59 cm (1.414 in) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	430.2 K (314.7°F) at 15000 s
Comments	None.

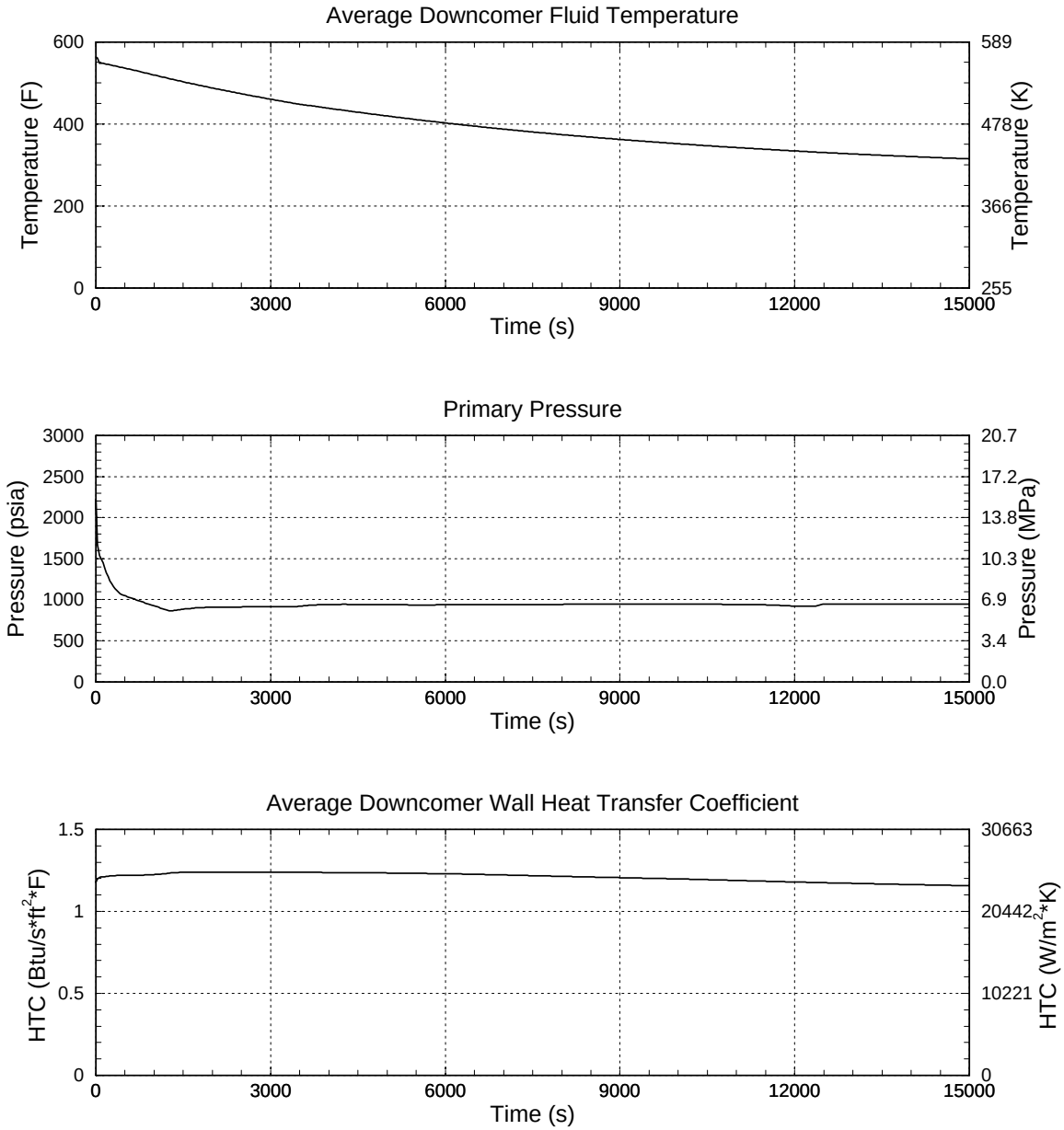


Figure A.2-109: Oconee PTS Results for Case 104

Case Category	LOCA-HZP
Primary Failures	5.08 cm (2 inch) surge line break with HPI failure.
Secondary Failures	None
Operator Actions	At 15 minutes after initiation, operator opens all TBVs to lower primary pressure and allow CFT and LPI injection.
Min DC Temp	299.4 K (79.2°F) at 15000 s
Comments	None.

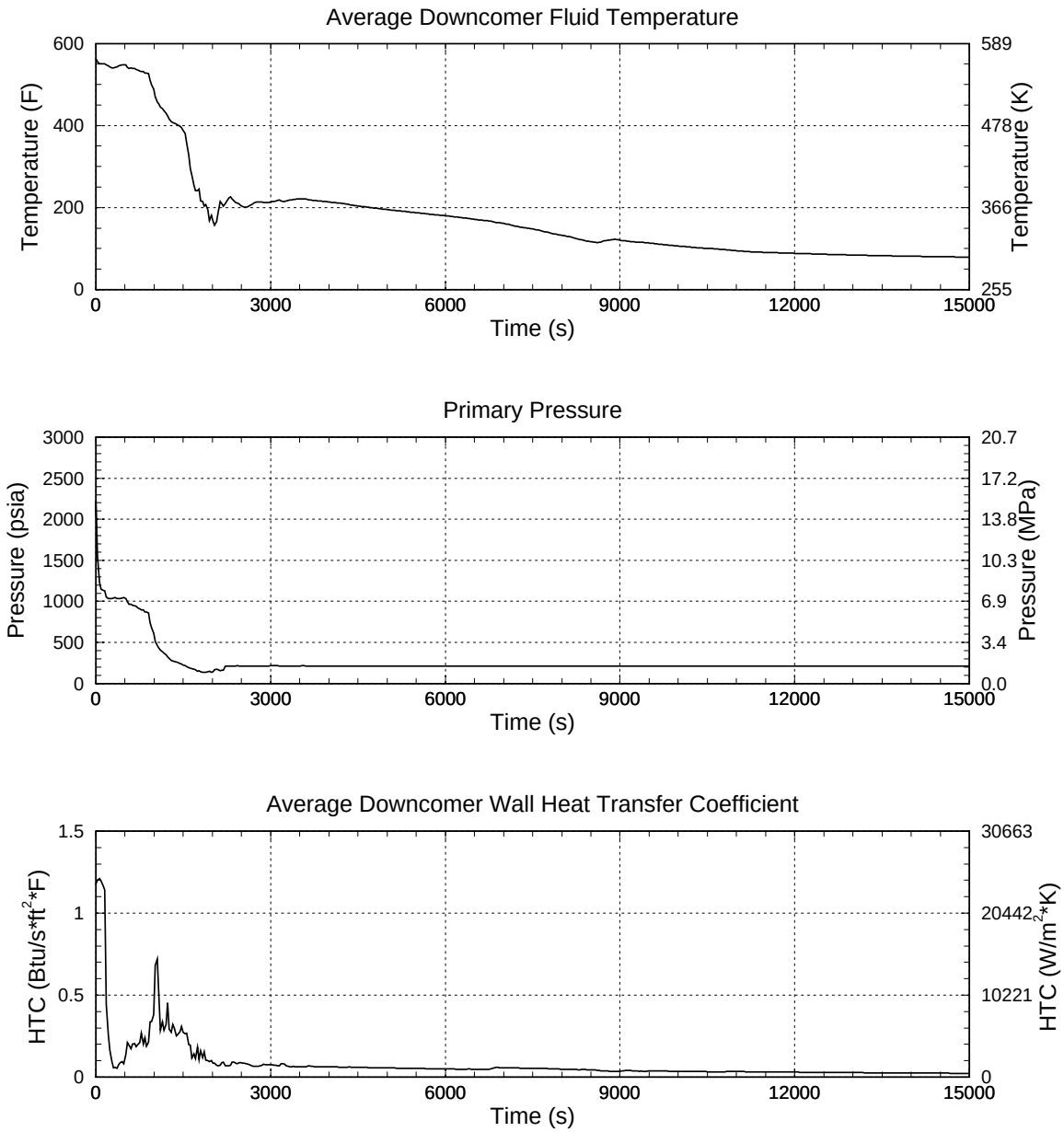


Figure A.2-110: Oconee PTS Results for Case 105

Case Category	LOCA-HZP
Primary Failures	7.18 cm (2.828 in) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	296.3 K (73.6°F) at 14880 s
Comments	None.

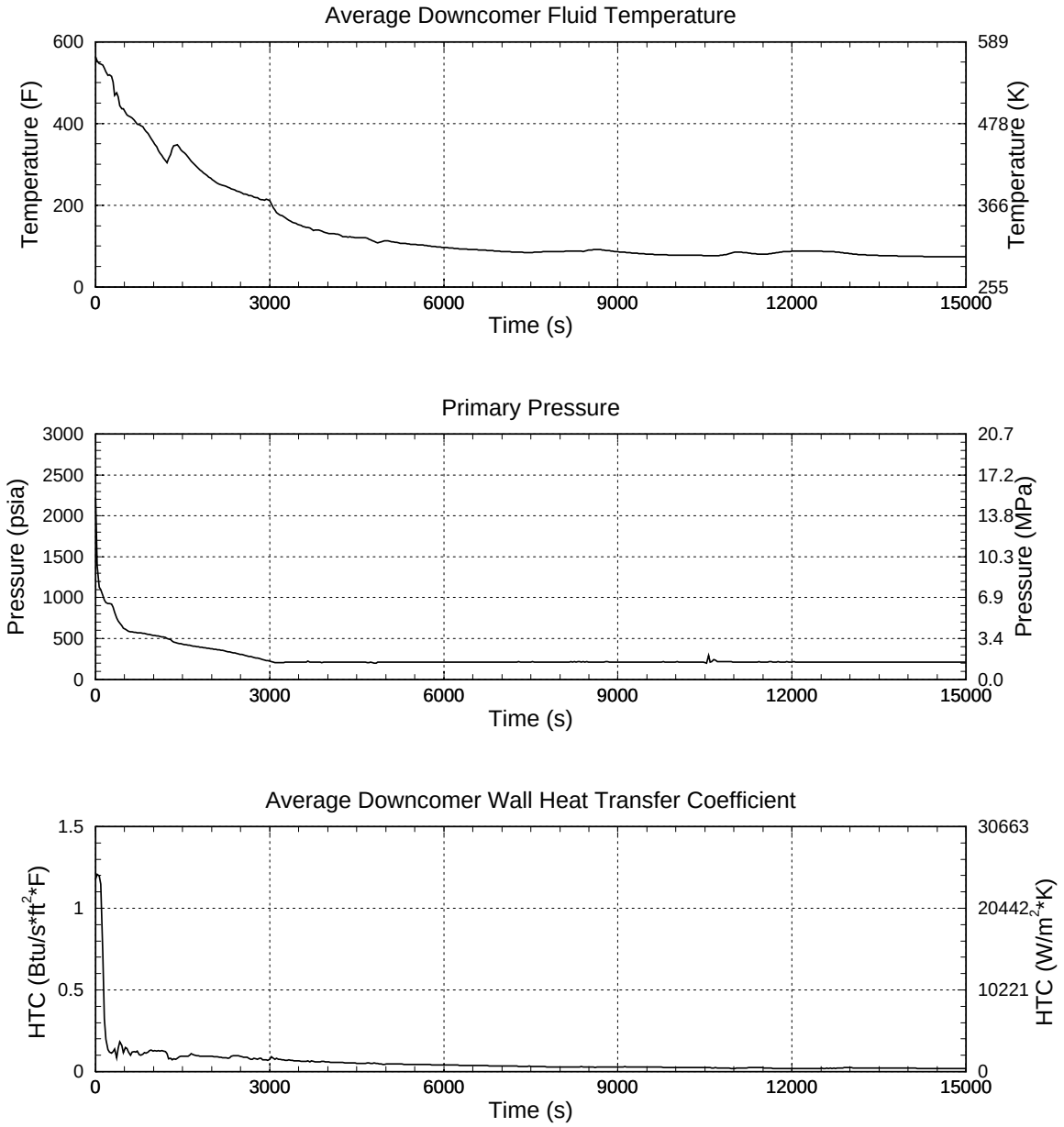


Figure A.2-111: Oconee PTS Results for Case 106

Case Category	LOCA-Hi K
Primary Failures	2.54 cm (1 inch) surge line break
Secondary Failures	2 stuck open safety valves in SG-A
Operator Actions	HPI terminated when subcooling margin exceeds 55.6 K (100°F)
Min DC Temp	337.8 K (148.4°F) at 10290 s
Comments	None.

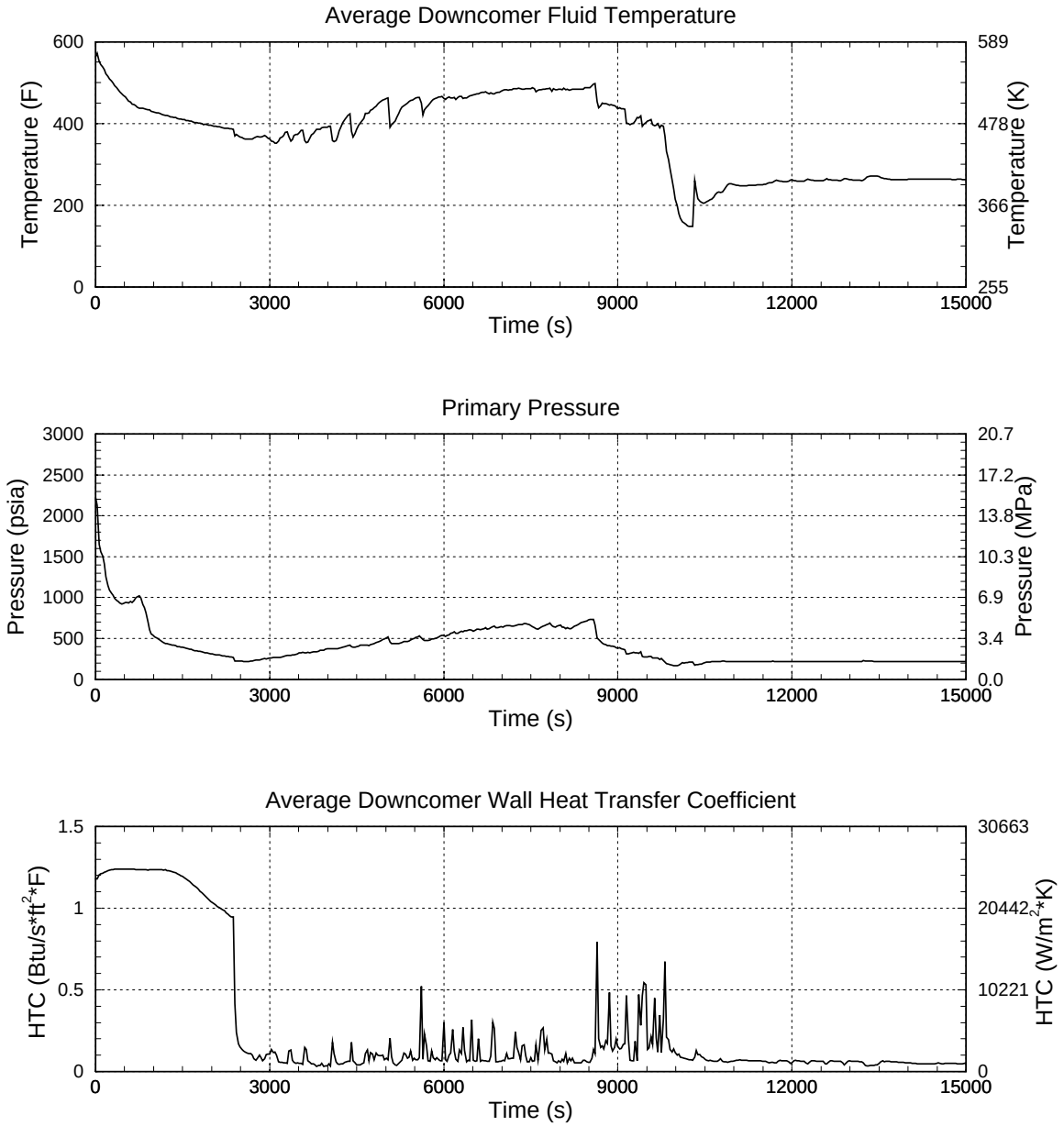


Figure A.2-112: Oconee PTS Results for Case 107

Case Category	TT/RT-Hi K
Primary Failures	Stuck open pressurizer safety valve
Secondary Failures	None
Operator Actions	None
Min DC Temp	298.7 K (77.9°F) at 12840 s
Comments	None.

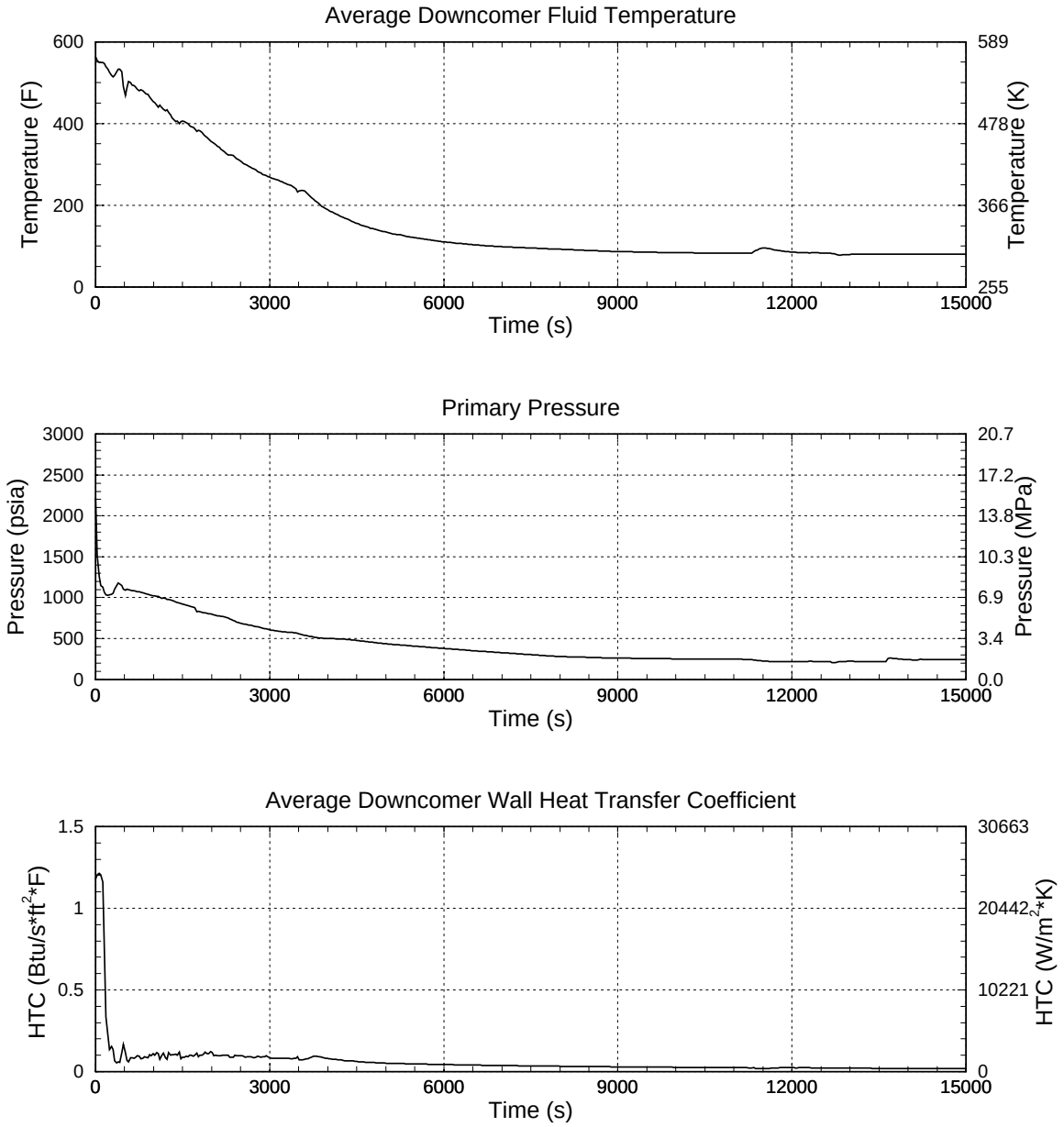


Figure A.2-113: Oconee PTS Results for Case 108

Case Category	TT/RT-Hi K
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 6000 secs (RCS low pressure point).
Secondary Failures	None
Operator Actions	None
Min DC Temp	315.6 K (108.5°F) at 6030 s
Comments	None.

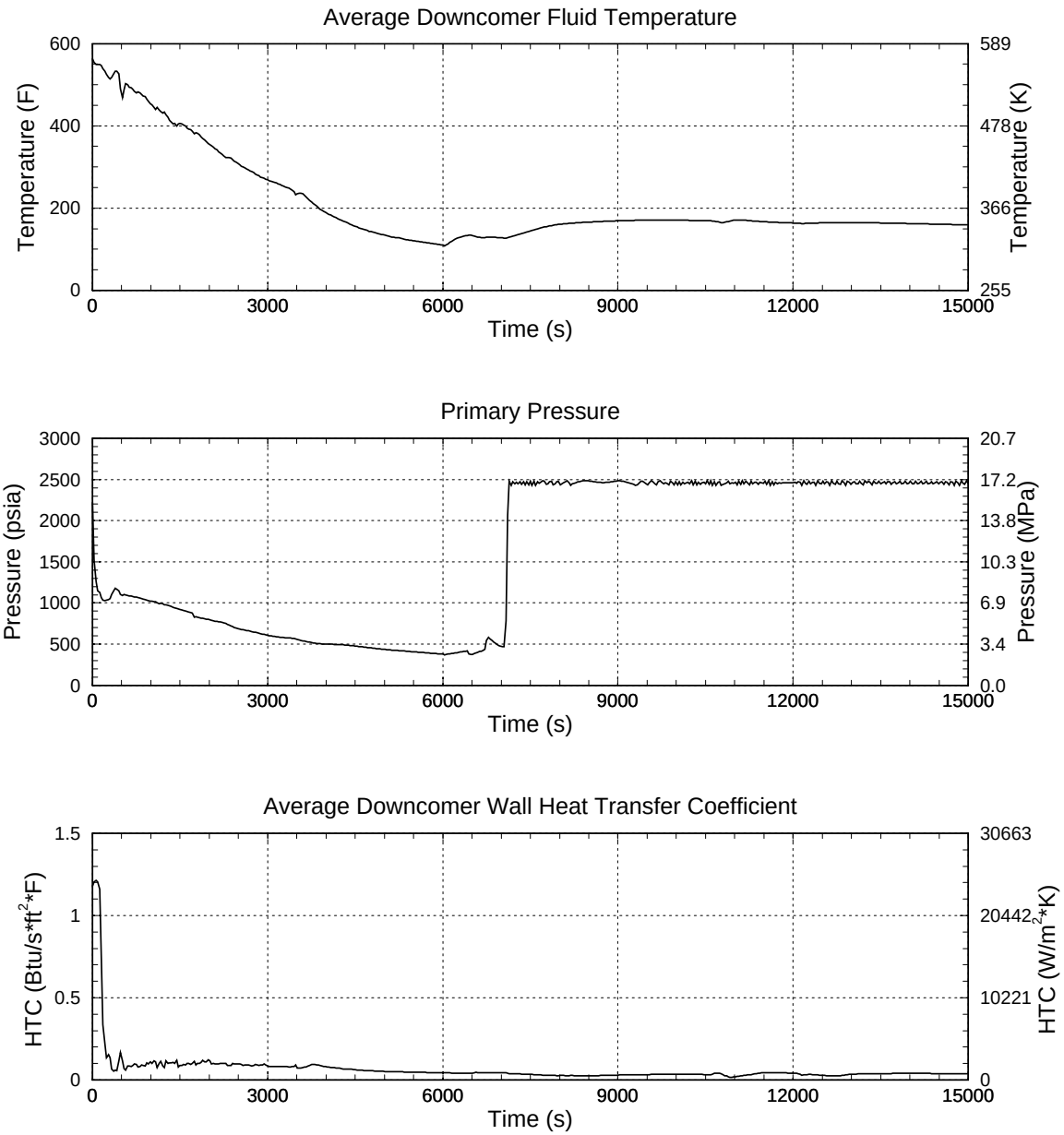


Figure A.2-114: Oconee PTS Results for Case 109

Case Category	LOCA-Hi K
Primary Failures	
Secondary Failures	None
Operator Actions	At 15 minutes after transient initiation, operator opens both TBV to lower primary system pressure and allow CFT and LPI injection.
Min DC Temp	327.6 K (130.0°F) at 2370 s
Comments	None.

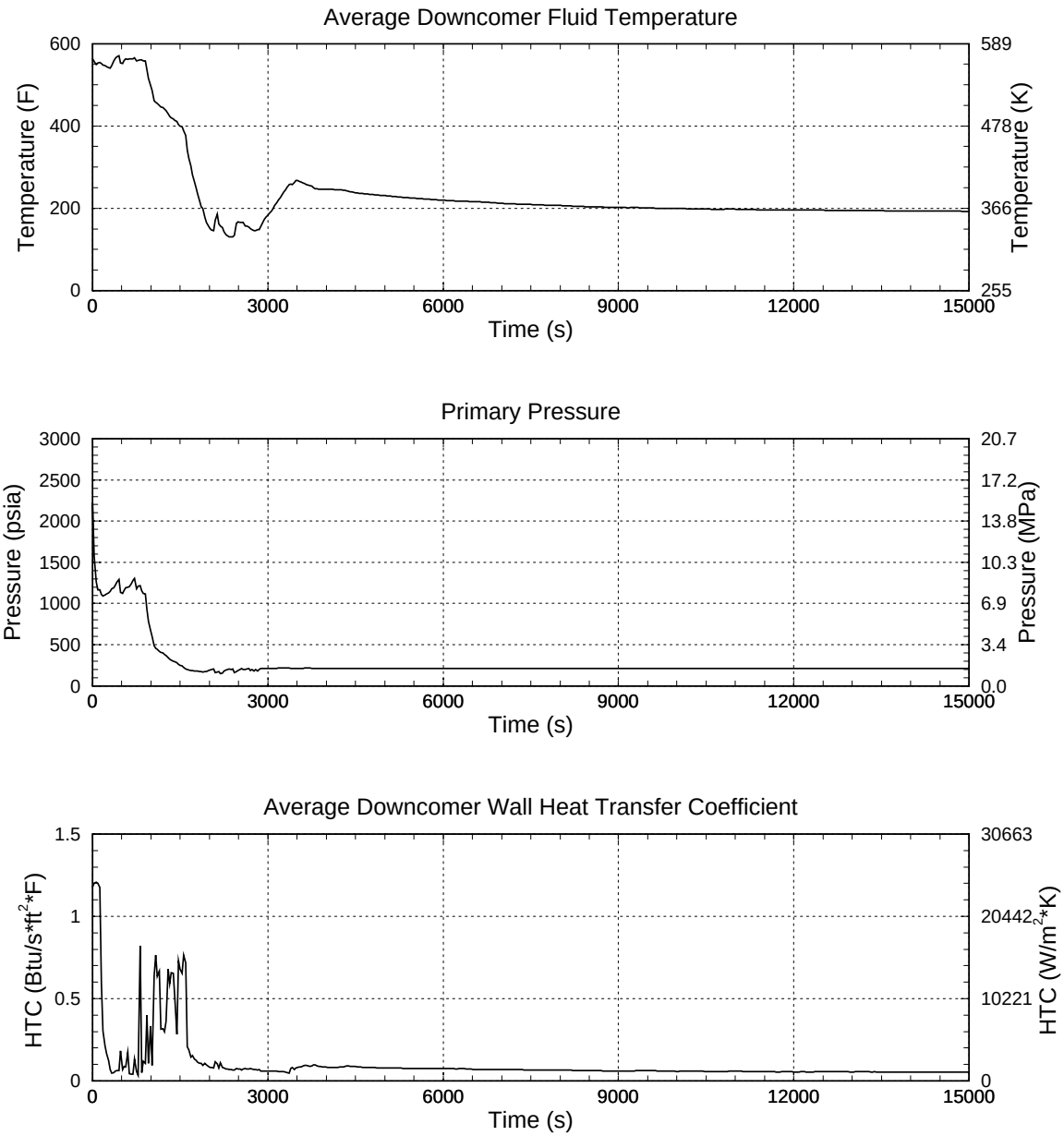


Figure A.2-115: Oconee PTS Results for Case 110

Case Category	LOCA-Hi K
Primary Failures	
Secondary Failures	None
Operator Actions	At 15 minutes after initiation, operator opens all TBVs to lower primary pressure and allow CFT and LPI injection. When the CFTs are 50% discharged, HPI is recovered. At 3000 seconds after initiation, operator starts throttling HPI to 55 K (100°F) subcooling and 254 cm (100 in) pressurizer level.
Min DC Temp	373.4 K (212.4°F) at 2700 s
Comments	None.

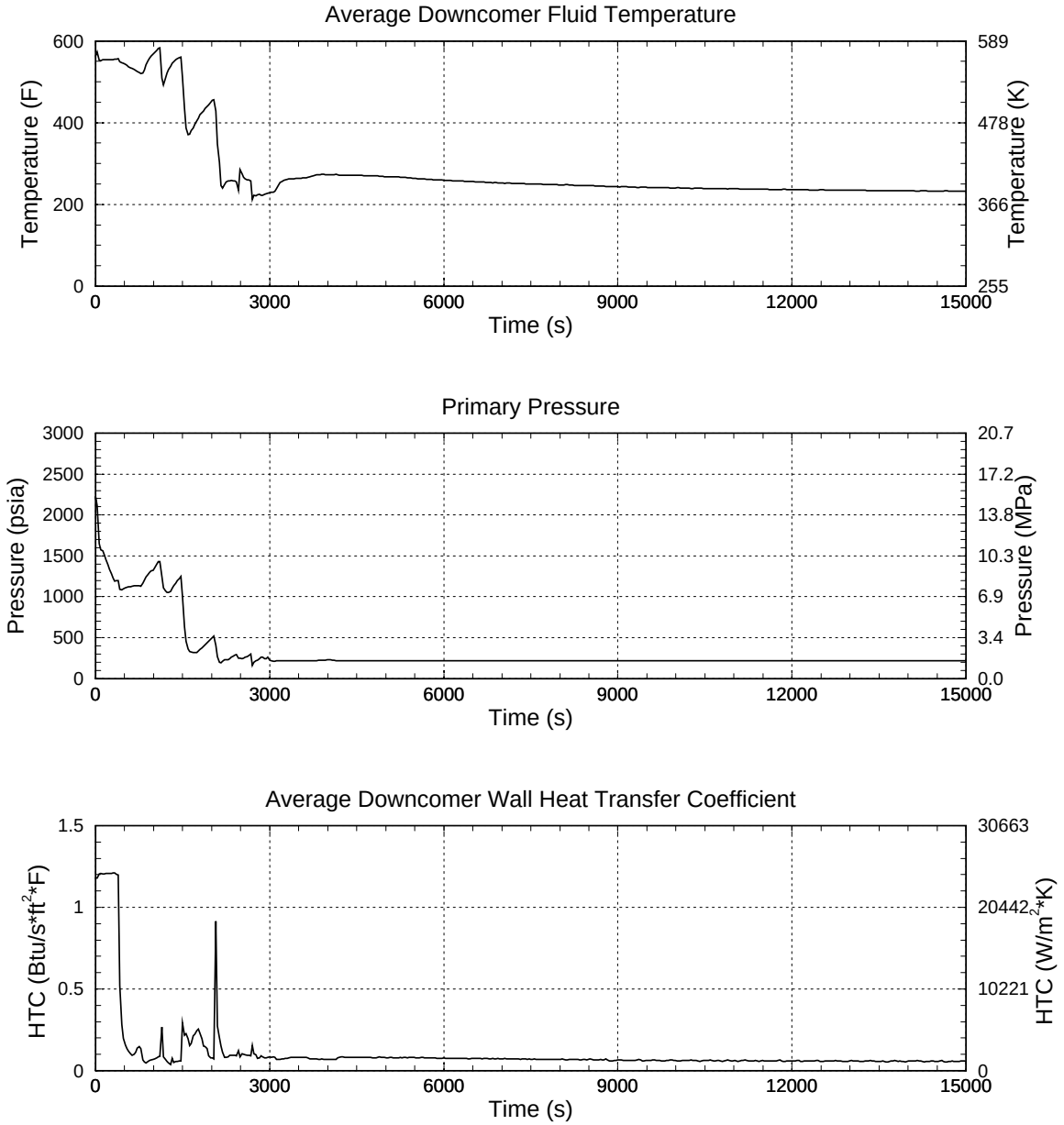


Figure A.2-116: Oconee PTS Results for Case 111

Case Category	TT/RT-Hi K
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 6000 secs.
Secondary Failures	None
Operator Actions	After valve recloses, operator throttles HPI 1 minute after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27 K (50°F) subcooling)
Min DC Temp	316.2 K (109.4°F) at 6030 s
Comments	None.

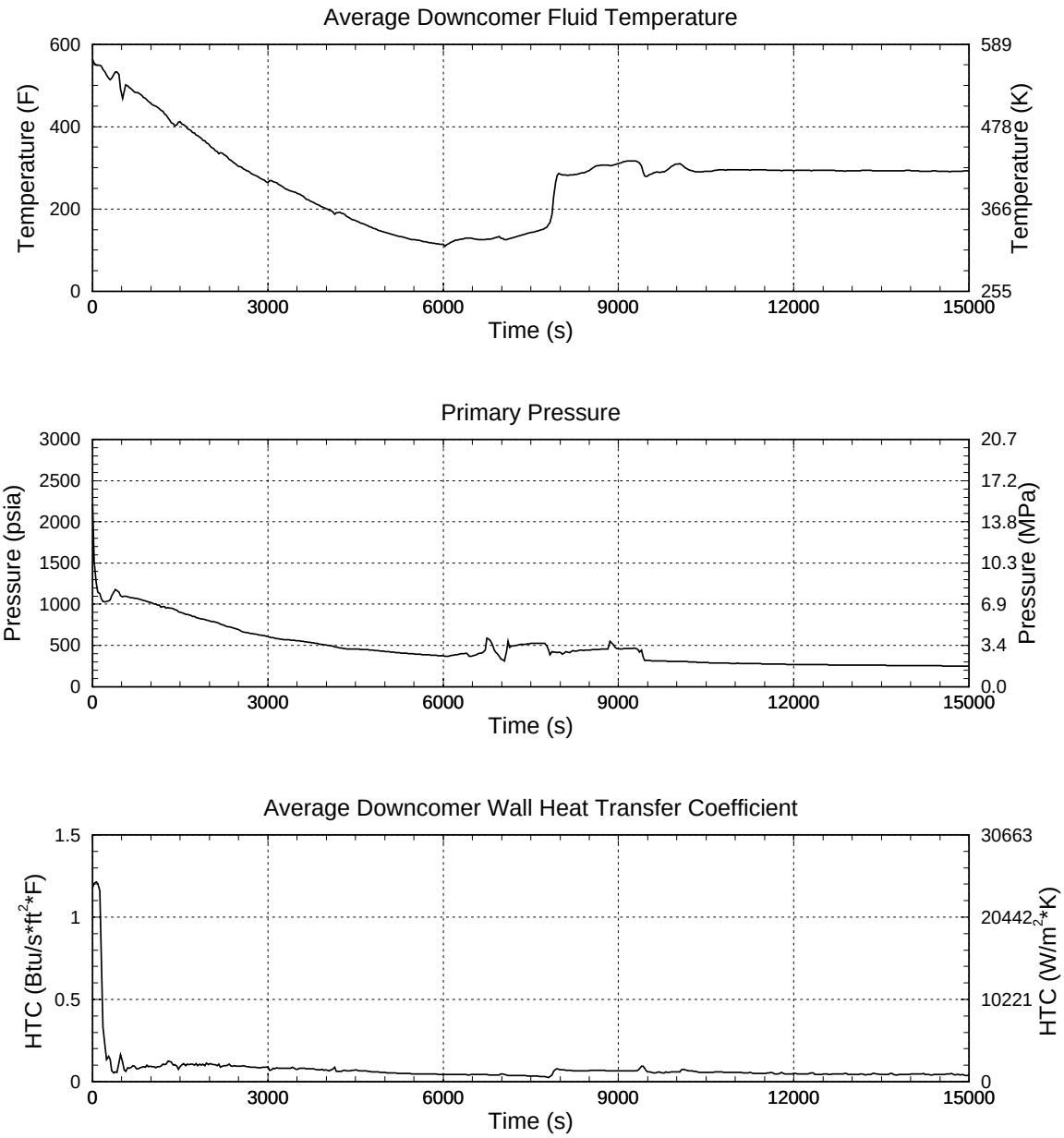


Figure A.2-117: Oconee PTS Results for Case 112

Case Category	TT/RT-Hi K
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 6000 secs.
Secondary Failures	None
Operator Actions	After valve recloses, operator throttles HPI 10 minutes after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling)
Min DC Temp	316.2 K (109.4°F) at 6030 s
Comments	None.

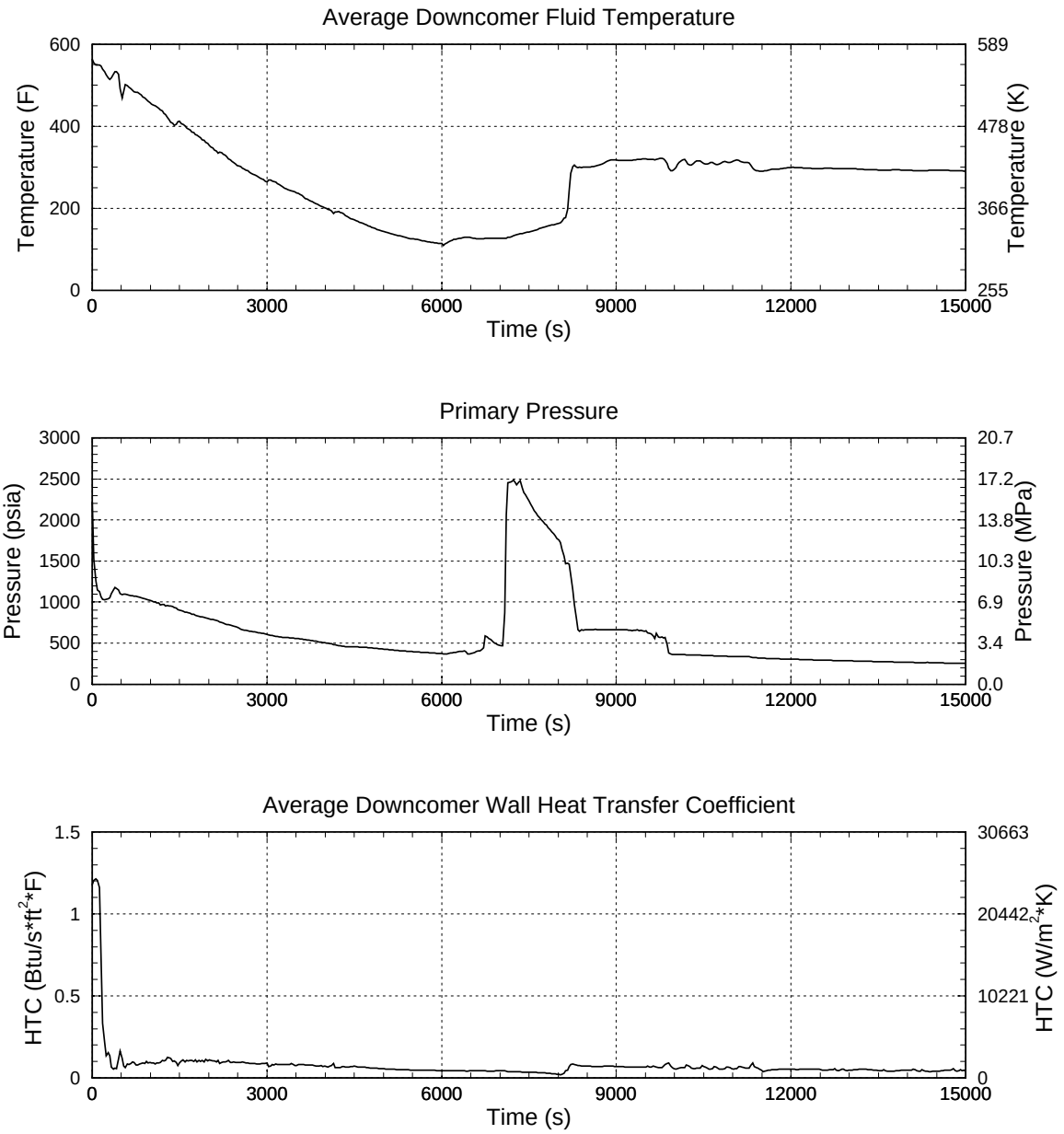


Figure A.2-118: Oconee PTS Results for Case 113

Case Category	TT/RT-Hi K
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 3000 secs.
Secondary Failures	None
Operator Actions	After valve recloses, operator throttles HPI 1 minute after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 50°F subcooling)
Min DC Temp	384.5 K (232.5°F) at 3990 s
Comments	None.

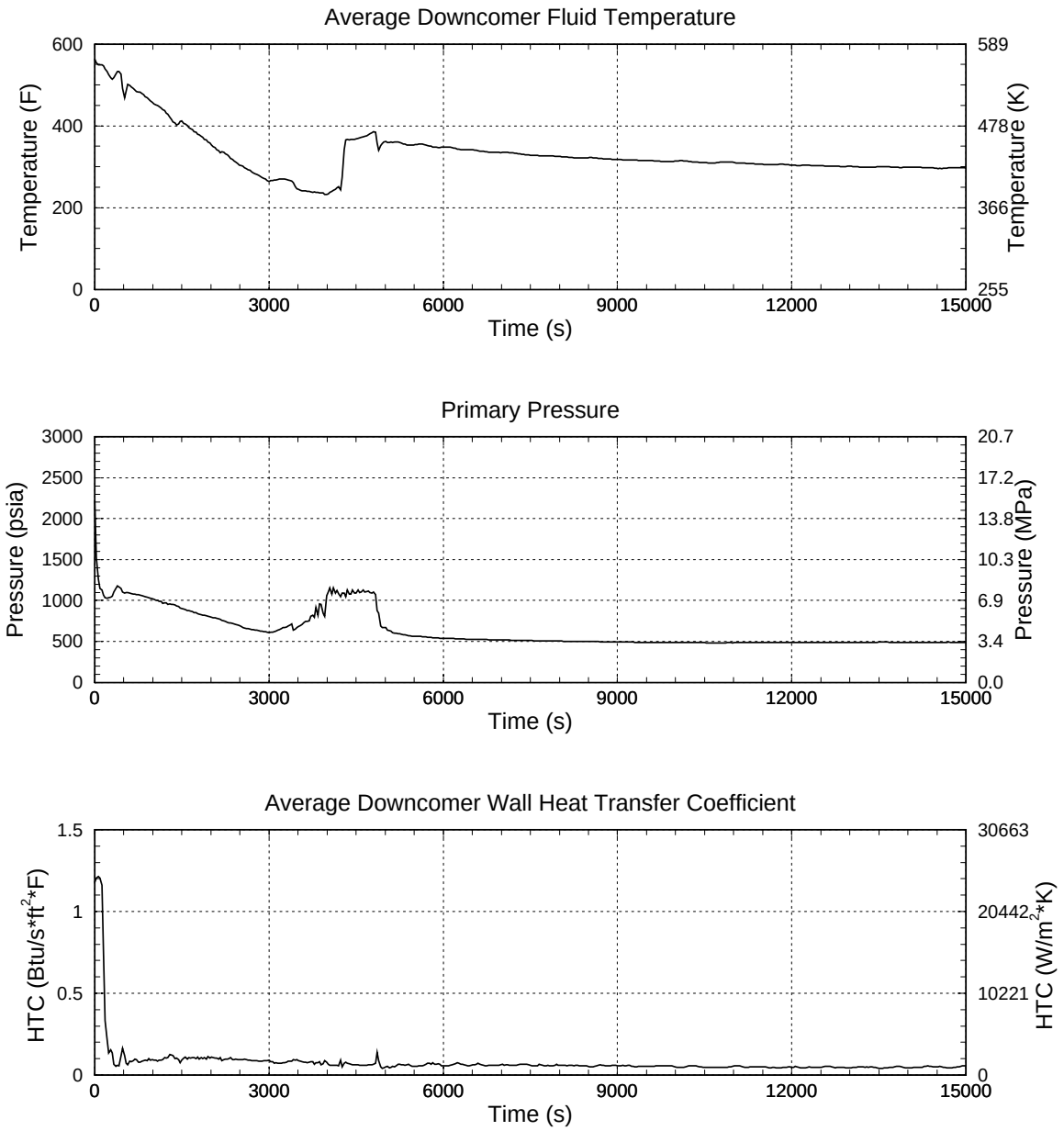


Figure A.2-119: Oconee PTS Results for Case 114

Case Category	TT/RT-Hi K
Primary Failures	
Secondary Failures	None
Operator Actions	After valve recloses, operator throttles HPI 10 minutes after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 50°F subcooling)
Min DC Temp	382.9 K (229.5°F) at 4020 s
Comments	None.

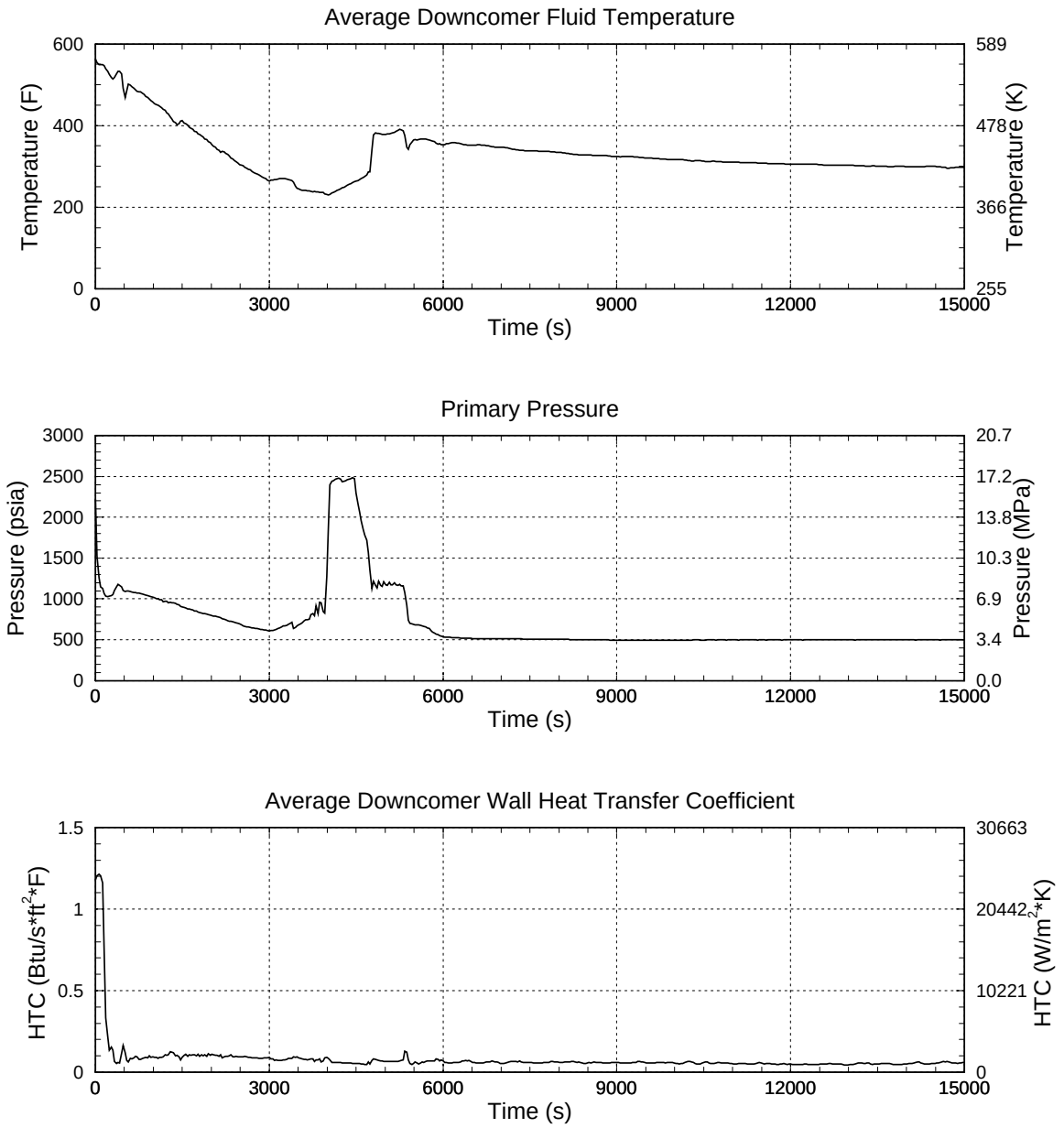


Figure A.2-120: Oconee PTS Results for Case 115

Case Category	TT/RT-Hi K
Primary Failures	
Secondary Failures	None
Operator Actions	At 15 minutes after initiation, operator opens all TBVs to lower primary pressure and allow CFT and LPI injection. When the CFTs are 50% discharged, HPI is recovered. The HPI is throttled 20 minutes after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 50°F subcooling).
Min DC Temp	325.7 K (126.6°F) at 4110 s
Comments	None.

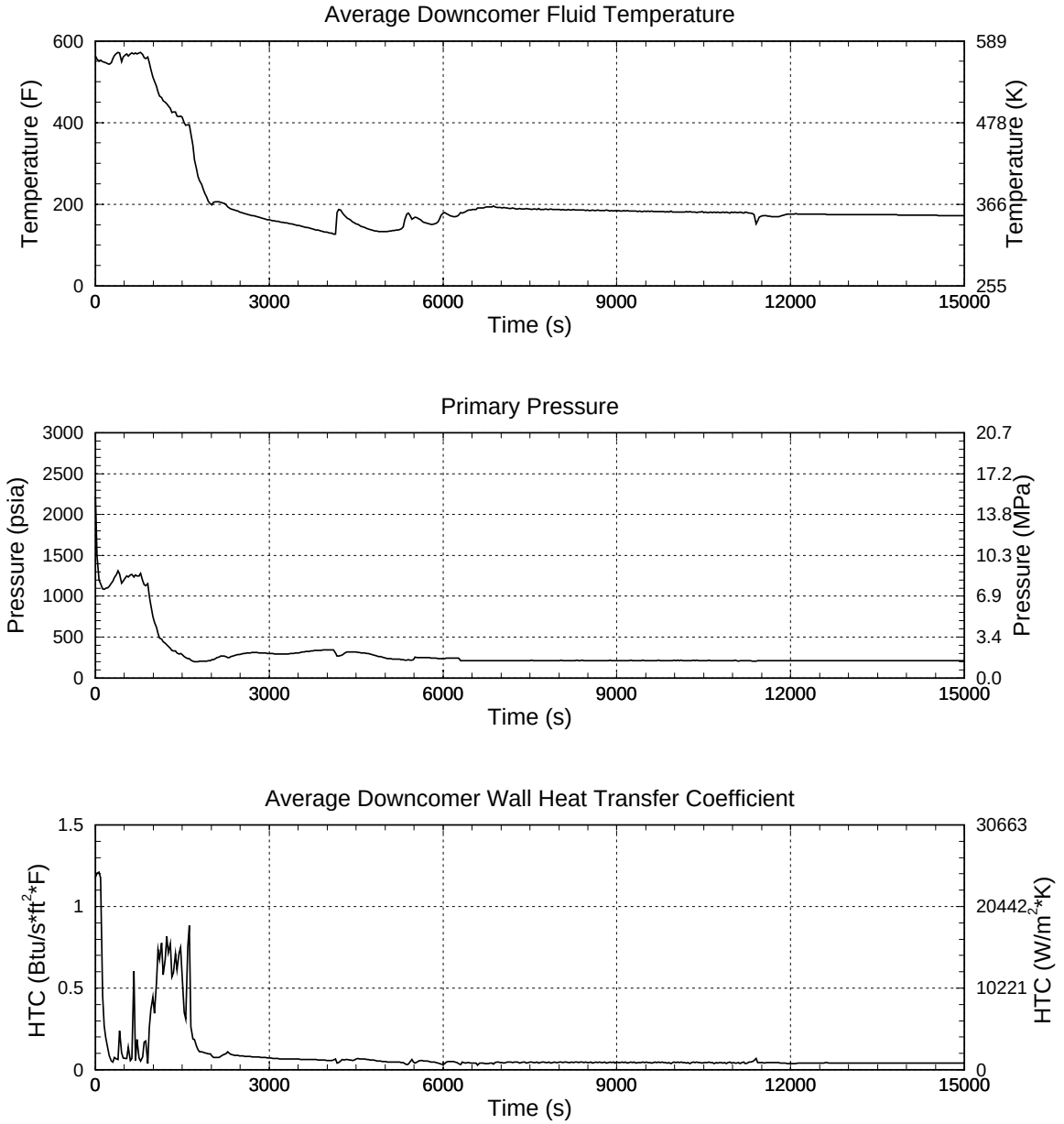


Figure A.2-121: Oconee PTS Results for Case 116

Case Category	TT/RT-Hi K
Primary Failures	
Secondary Failures	None
Operator Actions	At 15 minutes after initiation, operator opens all TBV to lower primary pressure and allow CFT and LPI injection. When the CFTs are 50% discharged, HPI is recovered. The SRV is closed 5 minutes after HPI recovered. HPI is throttled at 1 minute after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	366.7 K (200.5°F) at 1950 s
Comments	None.

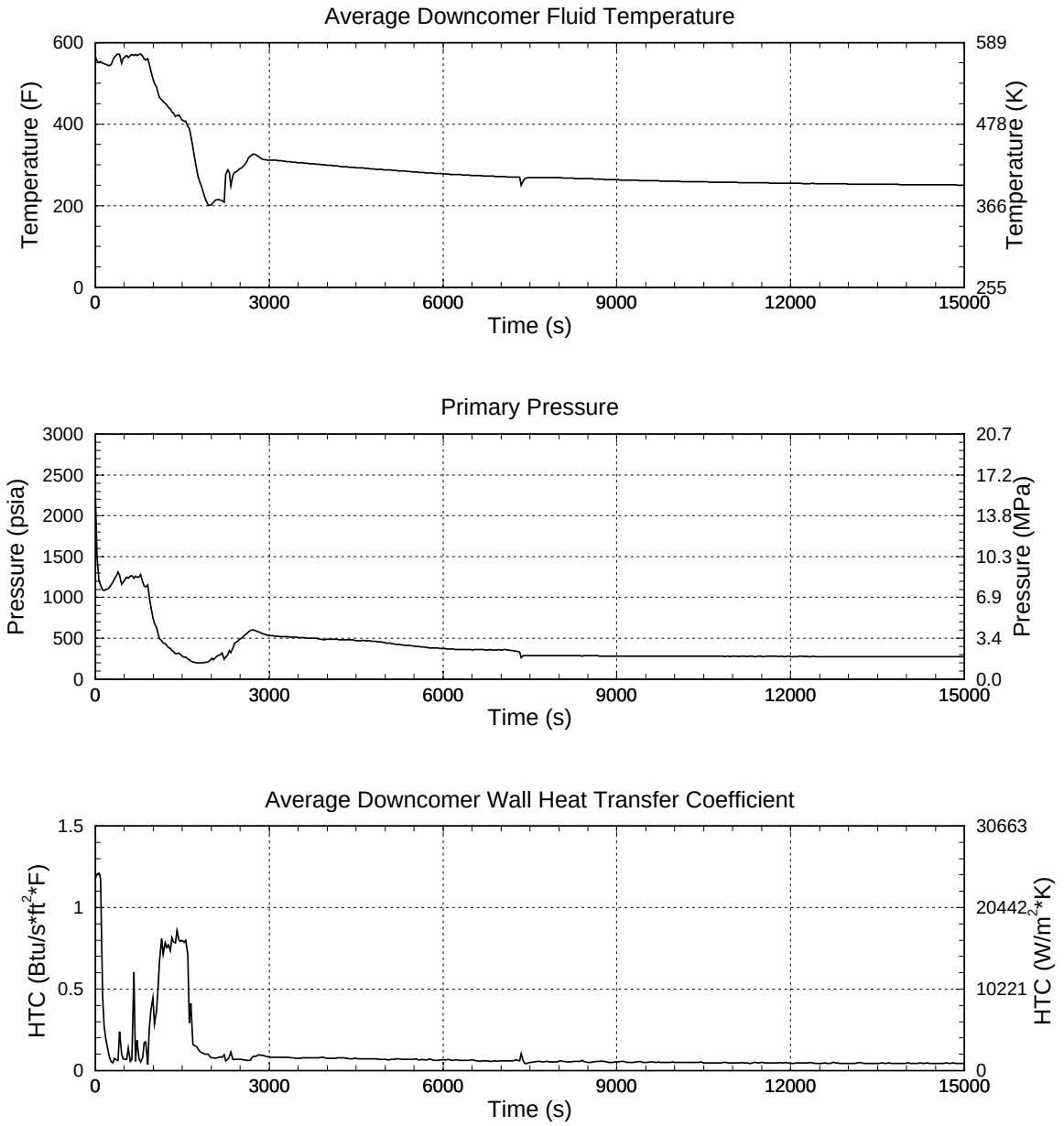


Figure A.2-122: Oconee PTS Results for Case 117

Case Category	LOCA-Hi K, HZP
Primary Failures	5.08 cm (2 inch) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	296.3 K (73.6°F) at 14700 s
Comments	None.

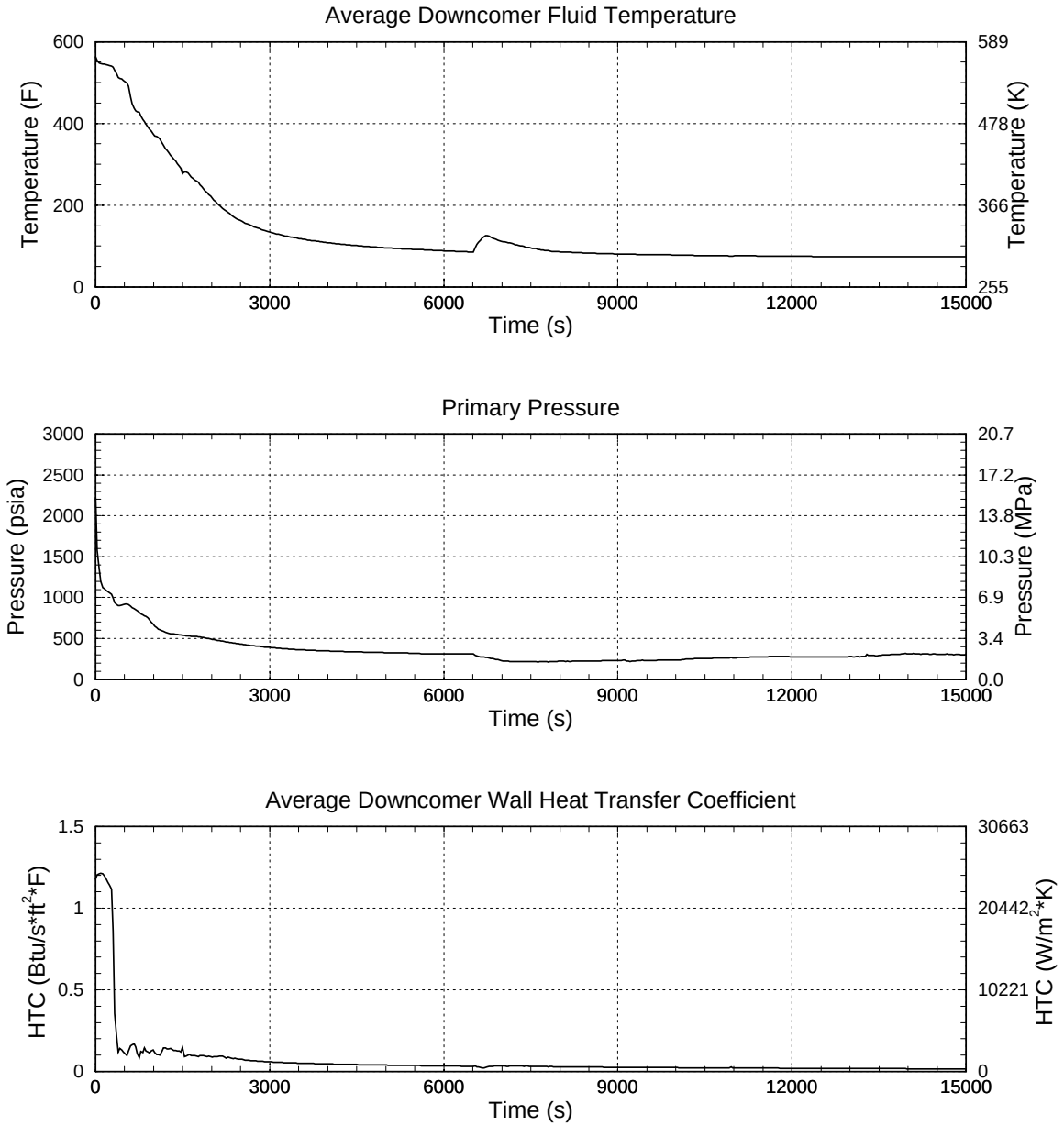


Figure A.2-123: Oconee PTS Results for Case 118

Case Category	LOCA-Hi K, HZP
Primary Failures	2.54 cm (1 in) surge line break with HPI Failure
Secondary Failures	None
Operator Actions	At 15 minutes after transient initiation, the operator opens all turbine bypass valves to lower primary system pressure and allow core flood tank and LPI injection.
Min DC Temp	340.0 K (152.4°F) at 15000 s
Comments	None.

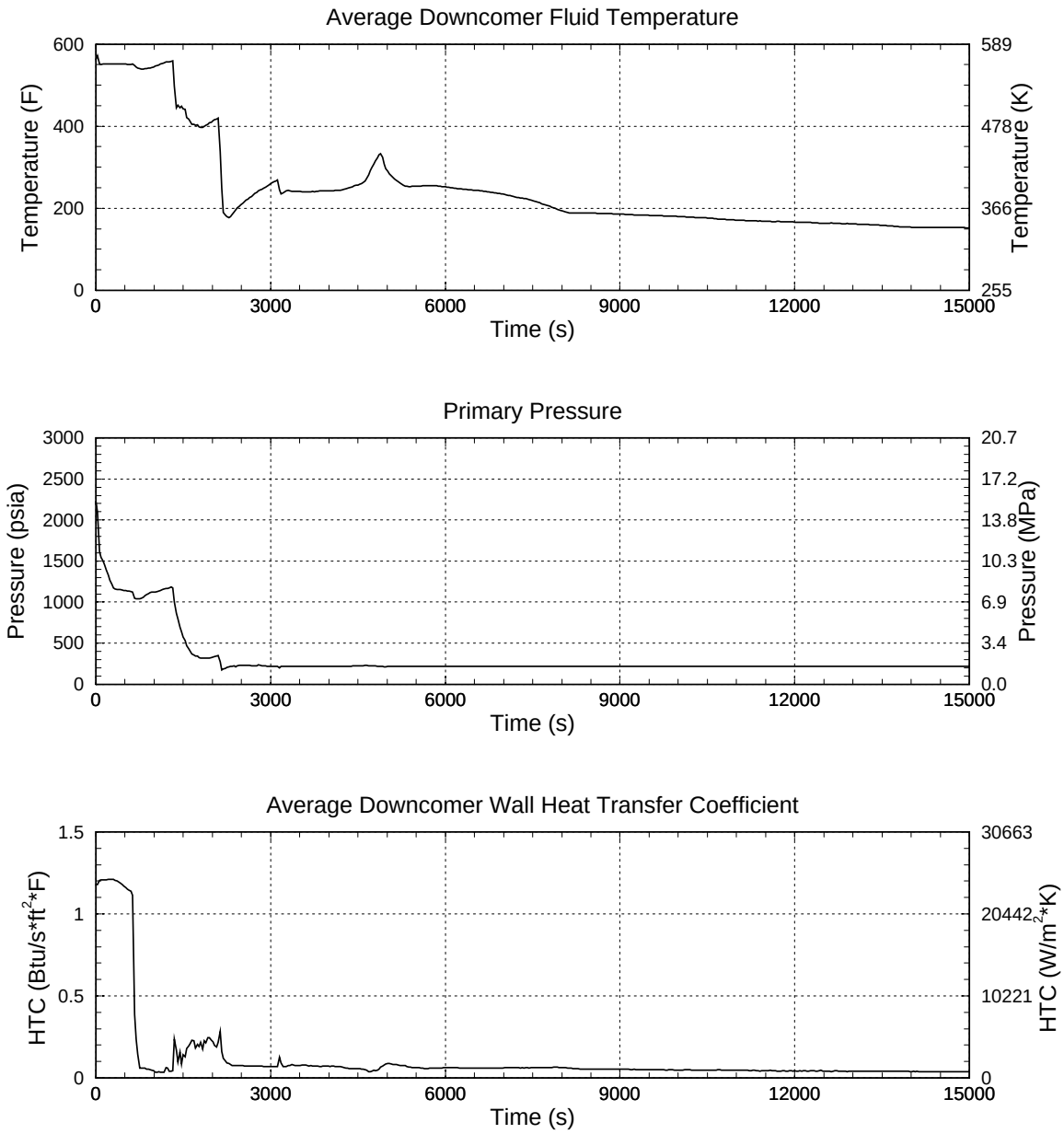


Figure A.2-124: Oconee PTS Results for Case 119

Case Category	LOCA-Hi K, HZP
Primary Failures	2.54 cm (1 in) surge line break with HPI Failure
Secondary Failures	None
Operator Actions	At 15 minutes after sequence initiation, operators open all TBVs to depressurize the system to the CFT setpoint. When the CFTs are 50 percent discharged, HPI is assumed to be recovered. The TBVs are assumed remain opened for the duration of the transient.
Min DC Temp	331.3 K (136.7°F) at 15000 s
Comments	None.

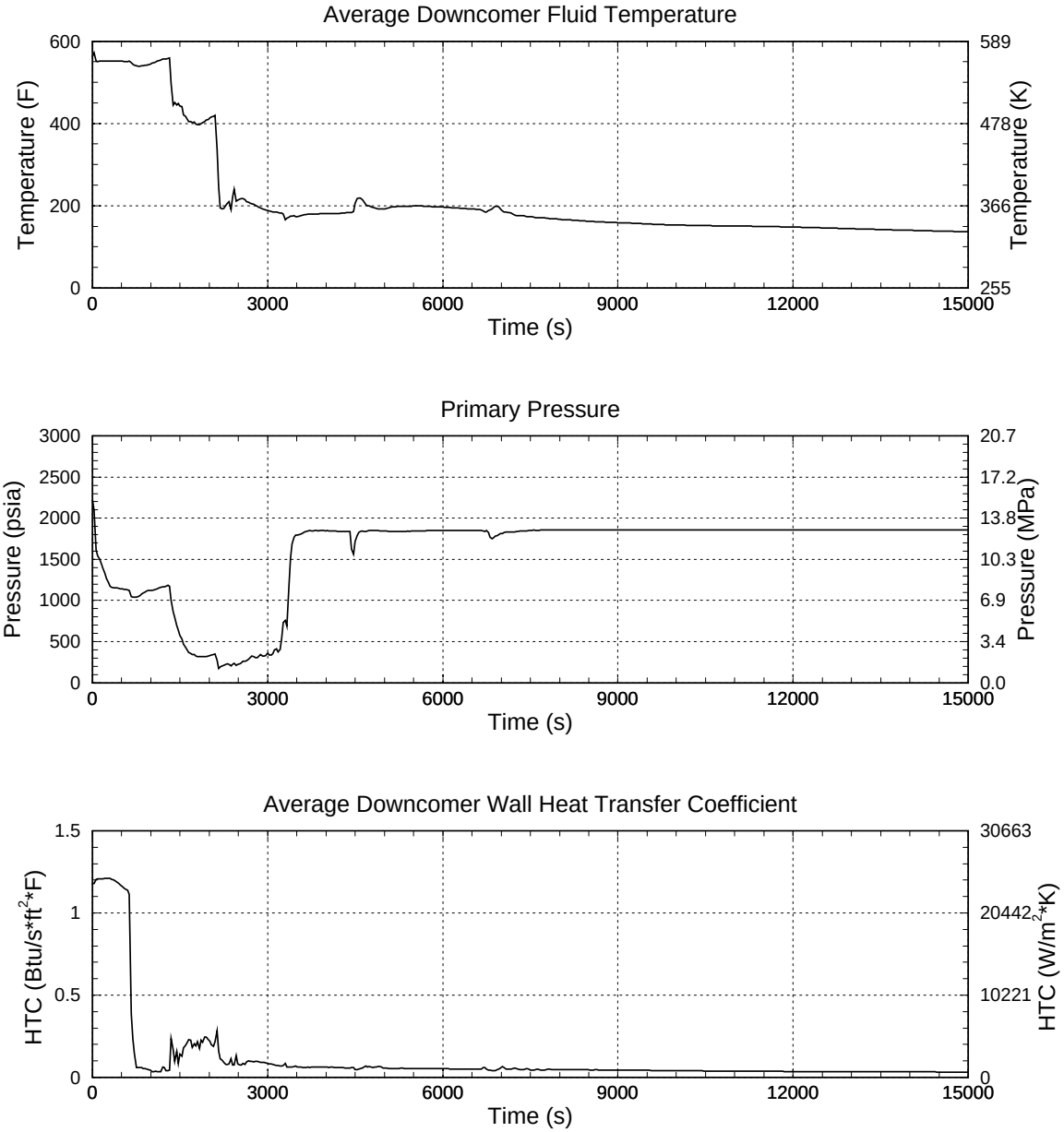


Figure A.2-125: Oconee PTS Results for Case 120

Case Category	TT/RT-Hi K, HZP
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 6000 secs .
Secondary Failures	None
Operator Actions	Operator throttles HPI at 1 minute after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	308.1 K (94.9°F) at 6450 s
Comments	None.

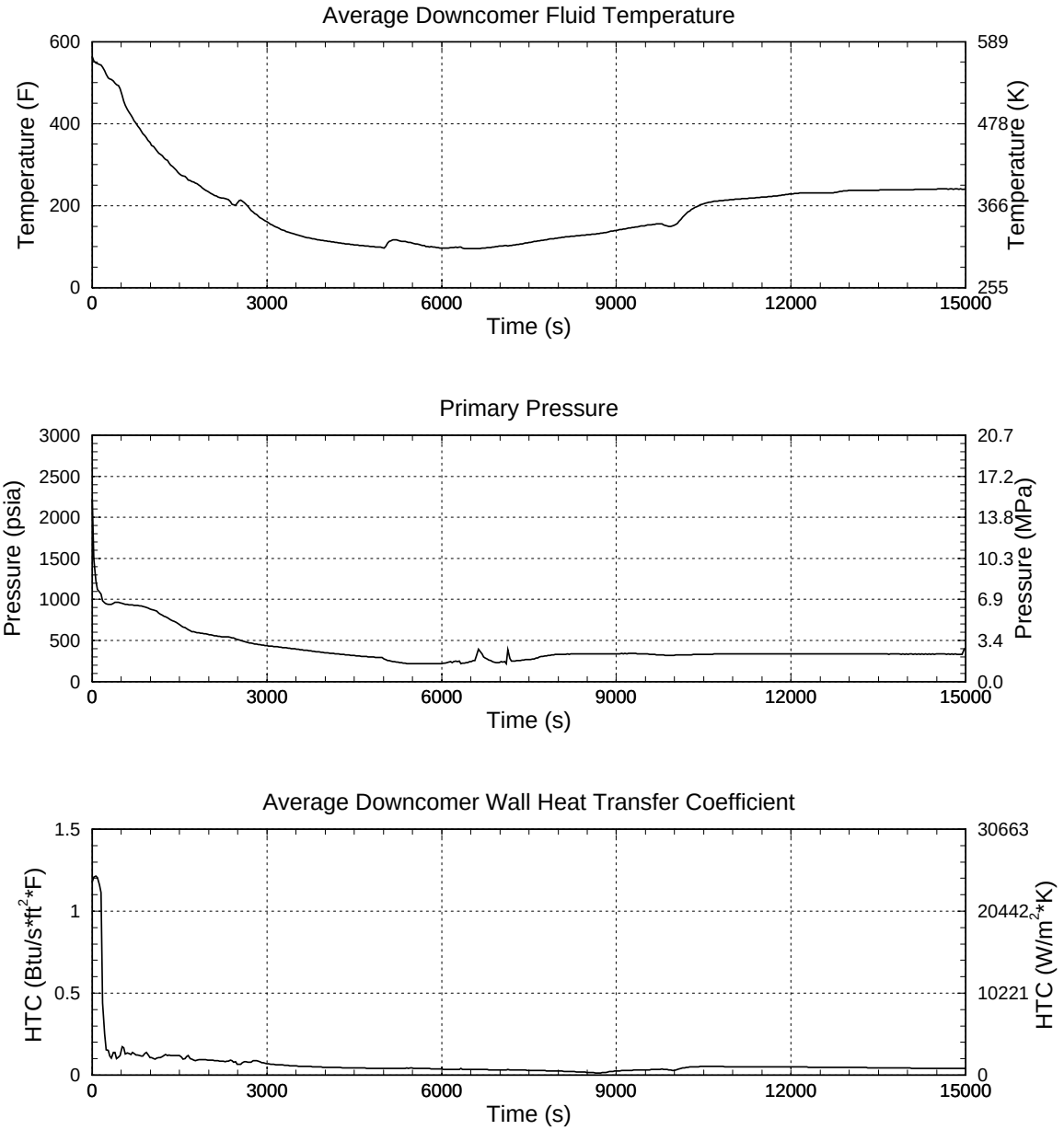
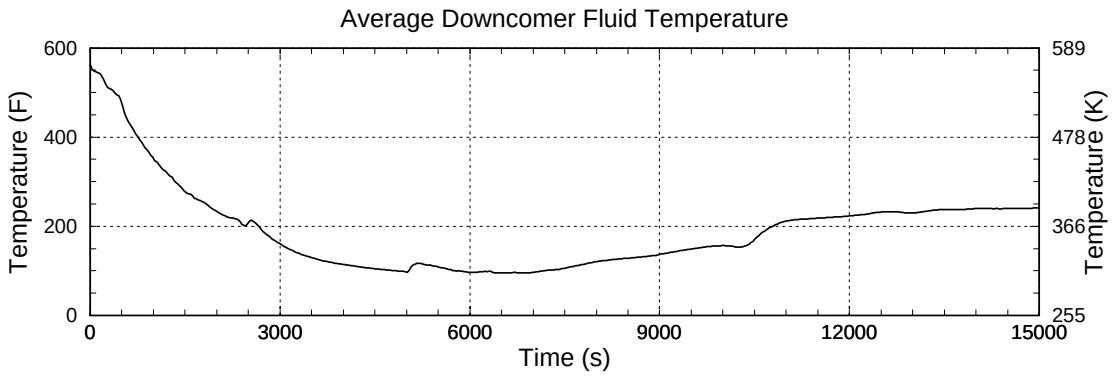
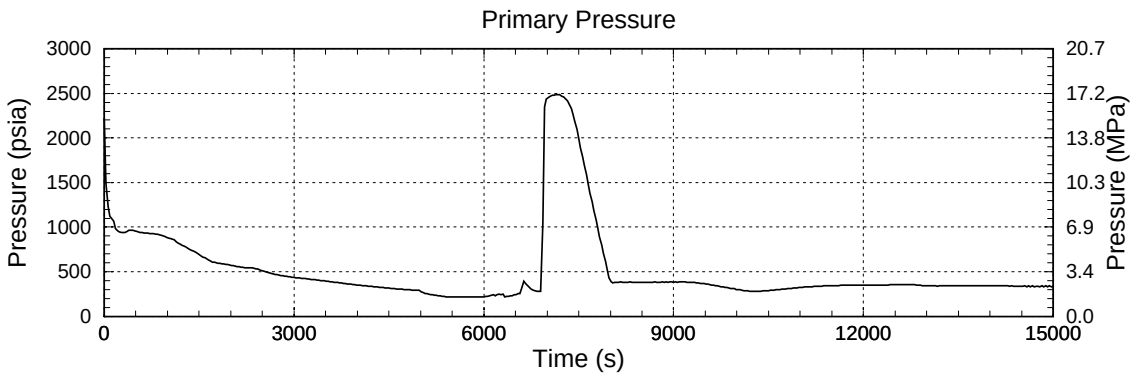


Figure A.2-126: Oconee PTS Results for Case 121

Case Category	TT/RT-Hi K, HZP
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 6000 secs.
Secondary Failures	None
Operator Actions	Operator throttles HPI at 10 minutes after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	308.1 K (94.9°F) at 6450 s
Comments	None.





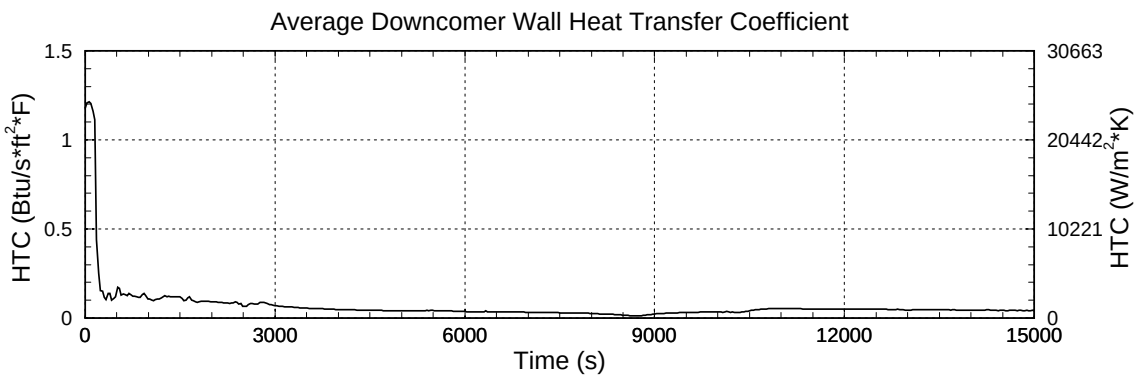


Figure A.2-127: Oconee PTS Results for Case 122

Case Category	TT/RT-Hi K, HZP
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 3000 secs.
Secondary Failures	None
Operator Actions	Operator throttles HPI at 1 minute after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	338.4 K (149.5°F) at 4290 s
Comments	None.

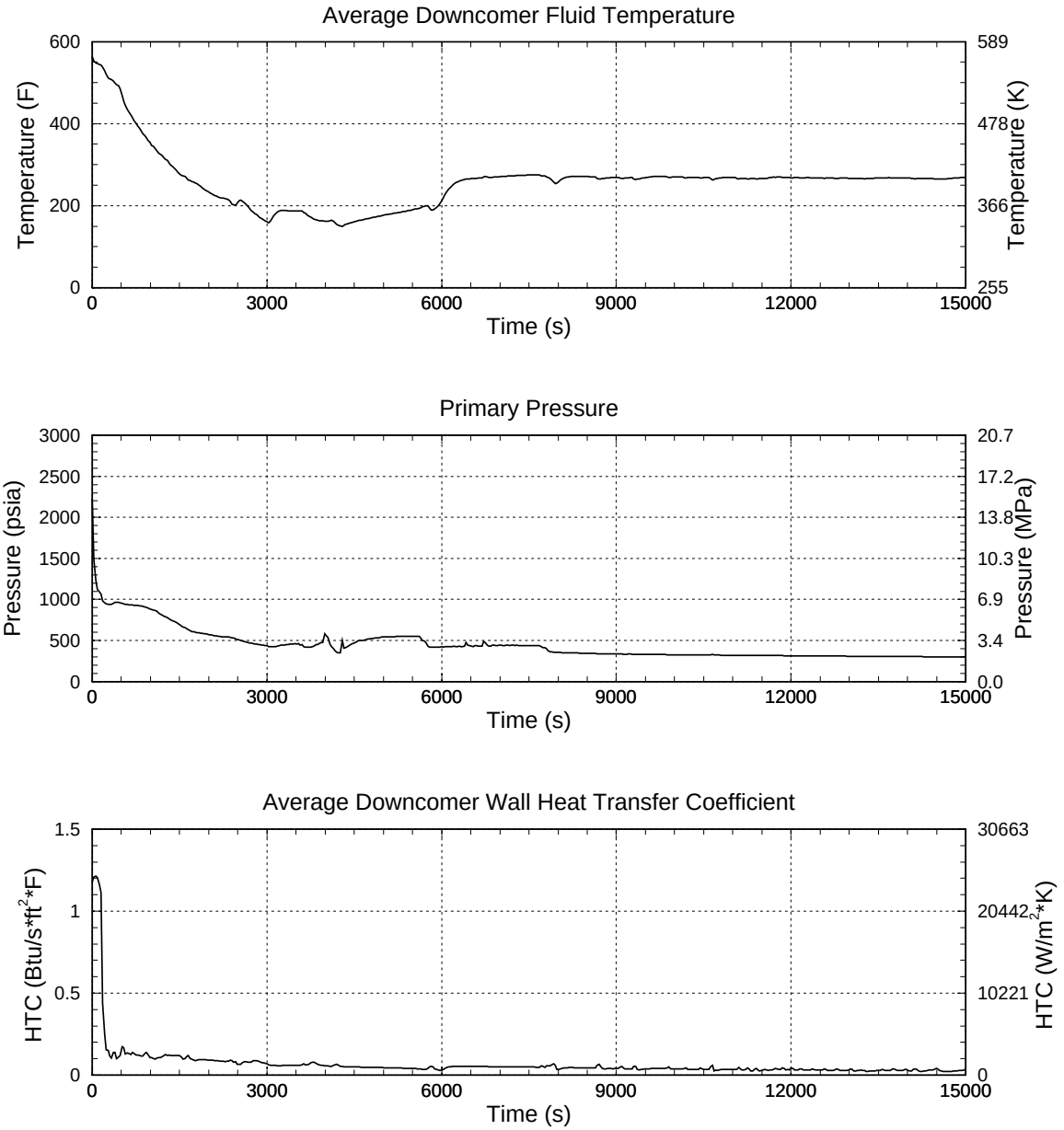


Figure A.2-128: Oconee PTS Results for Case 123

Case Category	TT/RT-Hi K, HZP
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 3000 secs.
Secondary Failures	None
Operator Actions	Operator throttles HPI at 10 minutes after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	340.6 K (153.4°F) at 4290 s
Comments	None.

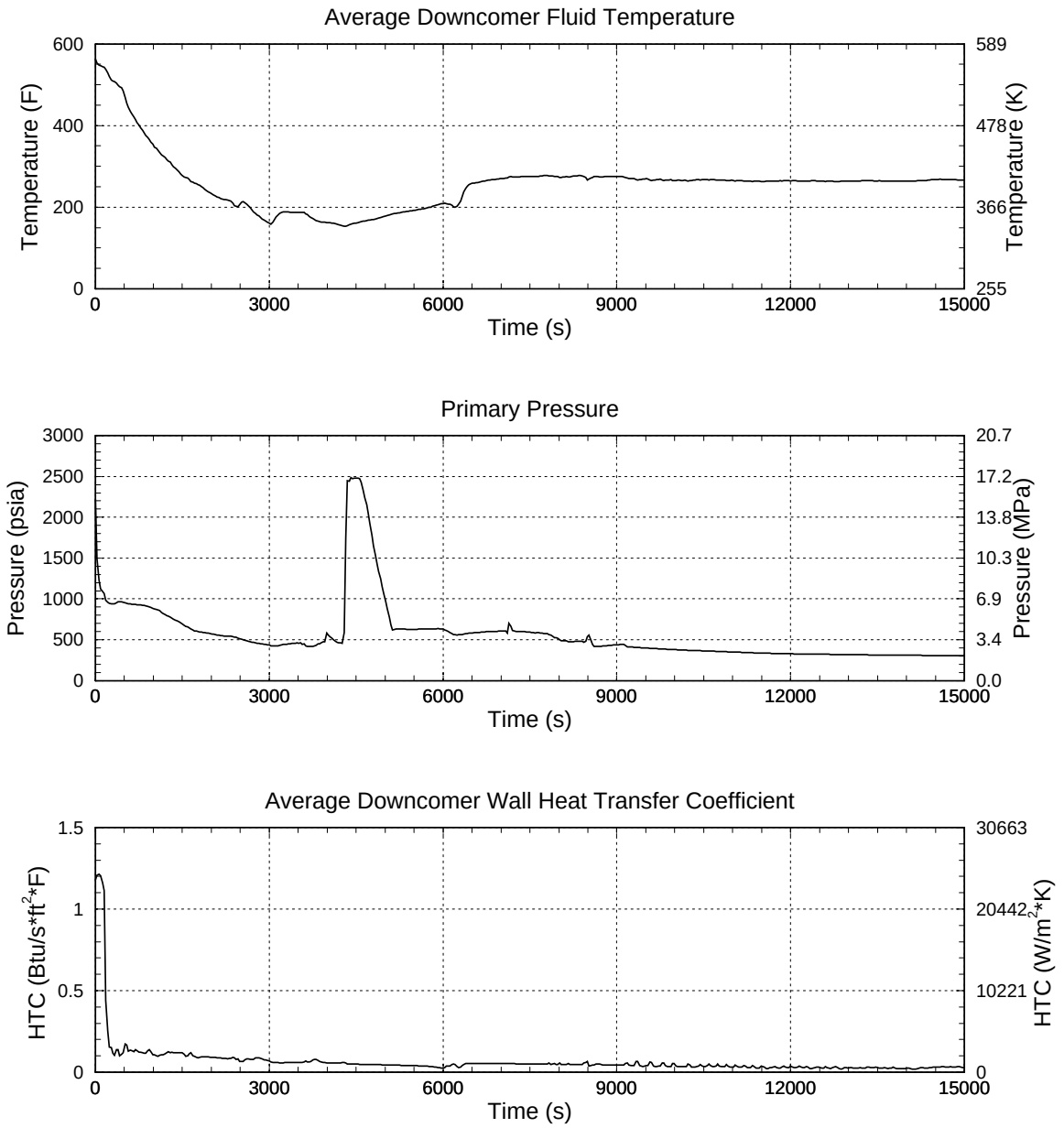
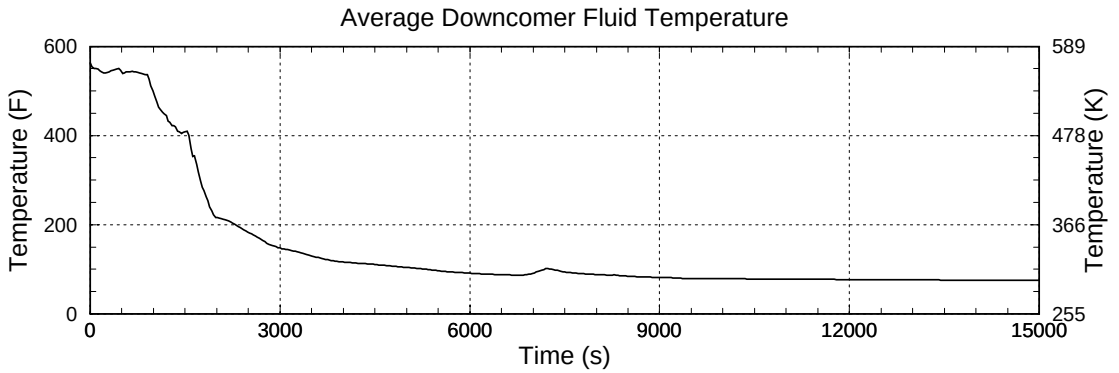
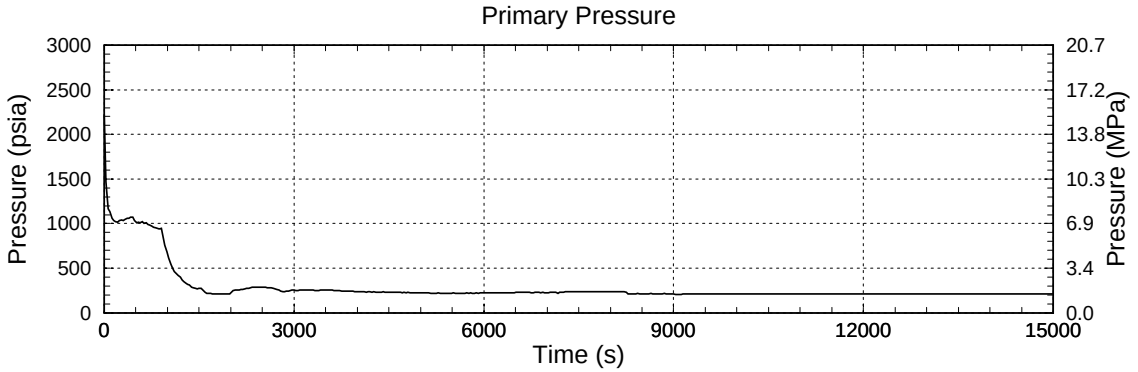


Figure A.2-129: Oconee PTS Results for Case 124

Case Category	TT/RT-Hi K, HZP
Primary Failures	Stuck open pressurizer safety valve and HPI Failure
Secondary Failures	None
Operator Actions	At 15 minutes after initiation, operator opens all TBVs to lower primary pressure and allow CFT and LPI injection. When the CFTs are 50% discharged, HPI is recovered. HPI is throttled 20 minutes after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	297.0 K (74.9°F) at 15000 s
Comments	None.





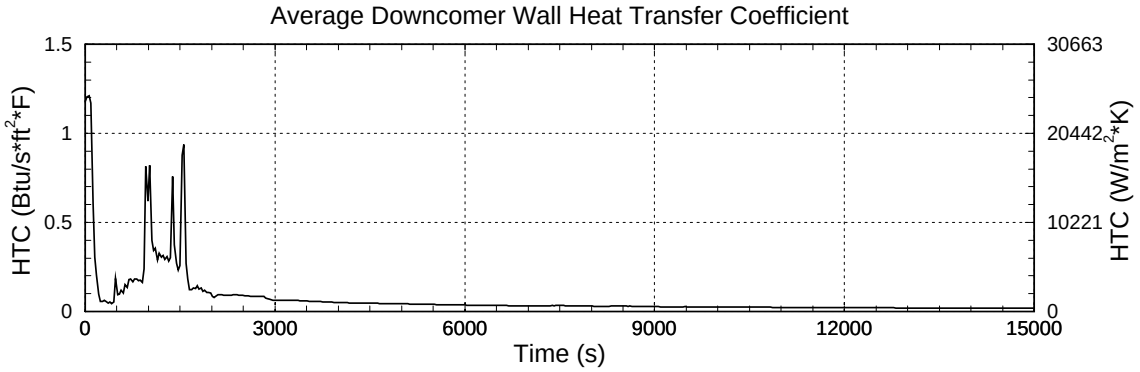


Figure A.2-130: Oconee PTS Results for Case 125

Case Category	TT/RT-Hi K, HZP
Primary Failures	Stuck open pressurizer safety valve and HPI Failure
Secondary Failures	None
Operator Actions	At 15 minutes after initiation, operator opens all TBVs to lower primary pressure and allow CFT and LPI injection. When the CFTs are 50% discharged, HPI is recovered. SRV is closed at 5 minutes after HPI is recovered. HPI is throttled at 1 minute after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	373.5 K (212.5°F) at 2070 s
Comments	None.

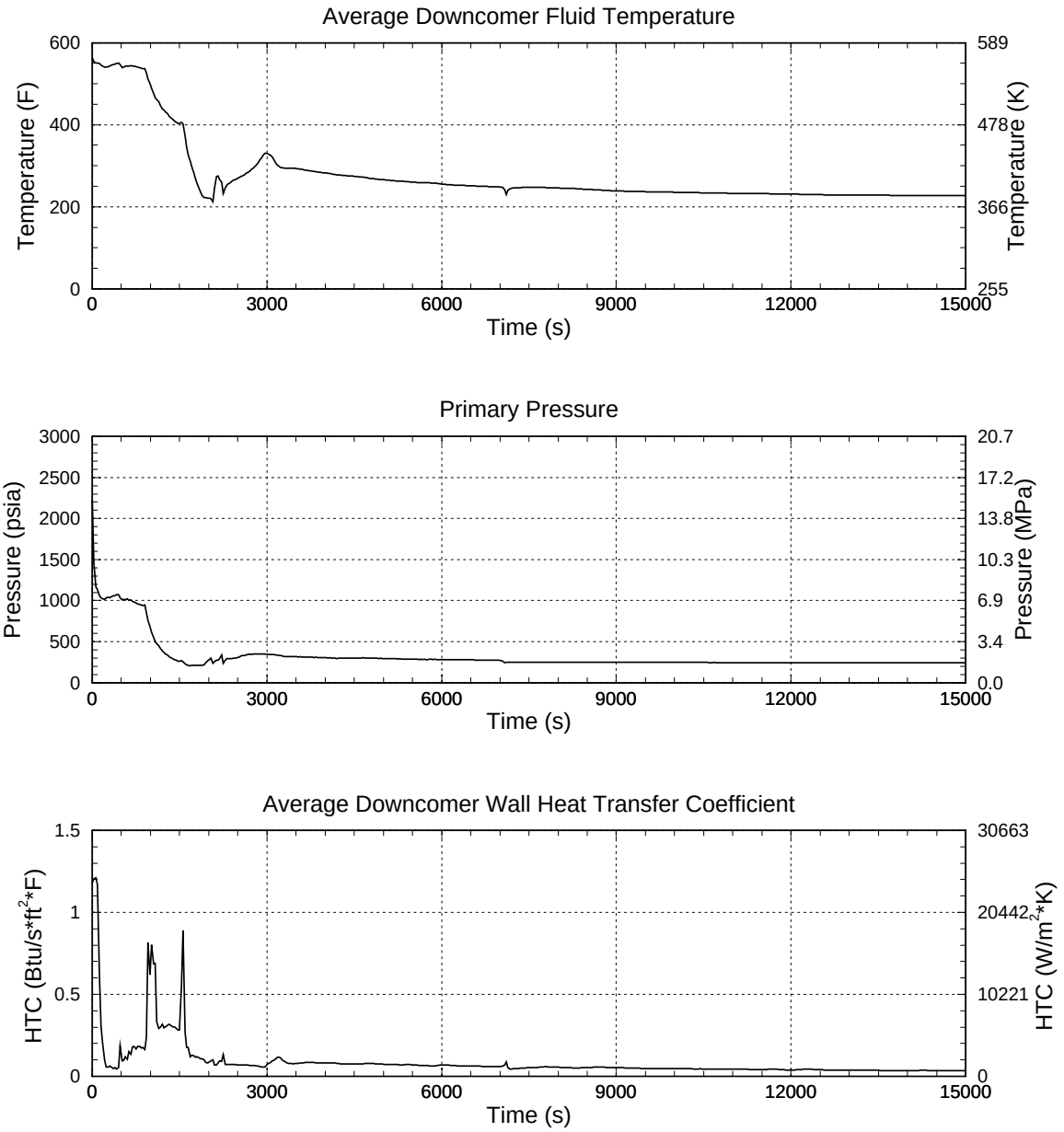


Figure A.2-131: Oconee PTS Results for Case 126

Case Category	SGTR-Hi K, HZP
Primary Failures	None
Secondary Failures	SGTR with a stuck open SRV in SG-B. A reactor trip is assumed to occur at the time of the tube rupture. Stuck safety relief valve is assumed to reclose 10 minutes after initiation.
Operator Actions	Operator trips RCP's 1 minute after initiation. Operator also throttles HPI 10 minutes after 2.77 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (assumed throttling criteria is 27 K (50°F) subcooling).
Min DC Temp	452.1 K (354.2°F) at 6600 s
Comments	None.

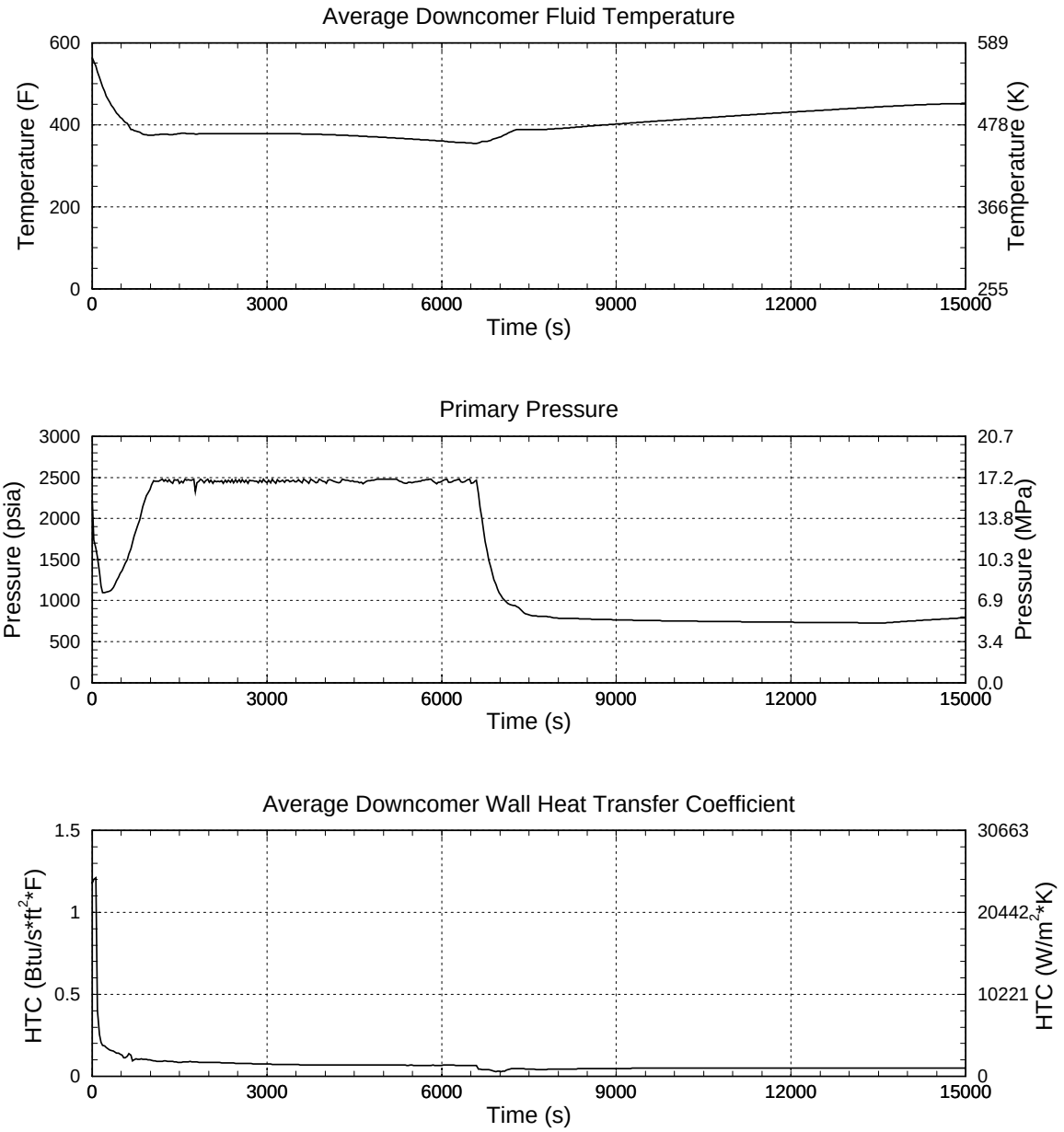


Figure A.2-132: Oconee PTS Results for Case 127

Case Category	LOCA-Hi K, HZP
Primary Failures	7.18 cm (2.828 in) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	295.3 K (71.8°F) at 12450 s
Comments	None.

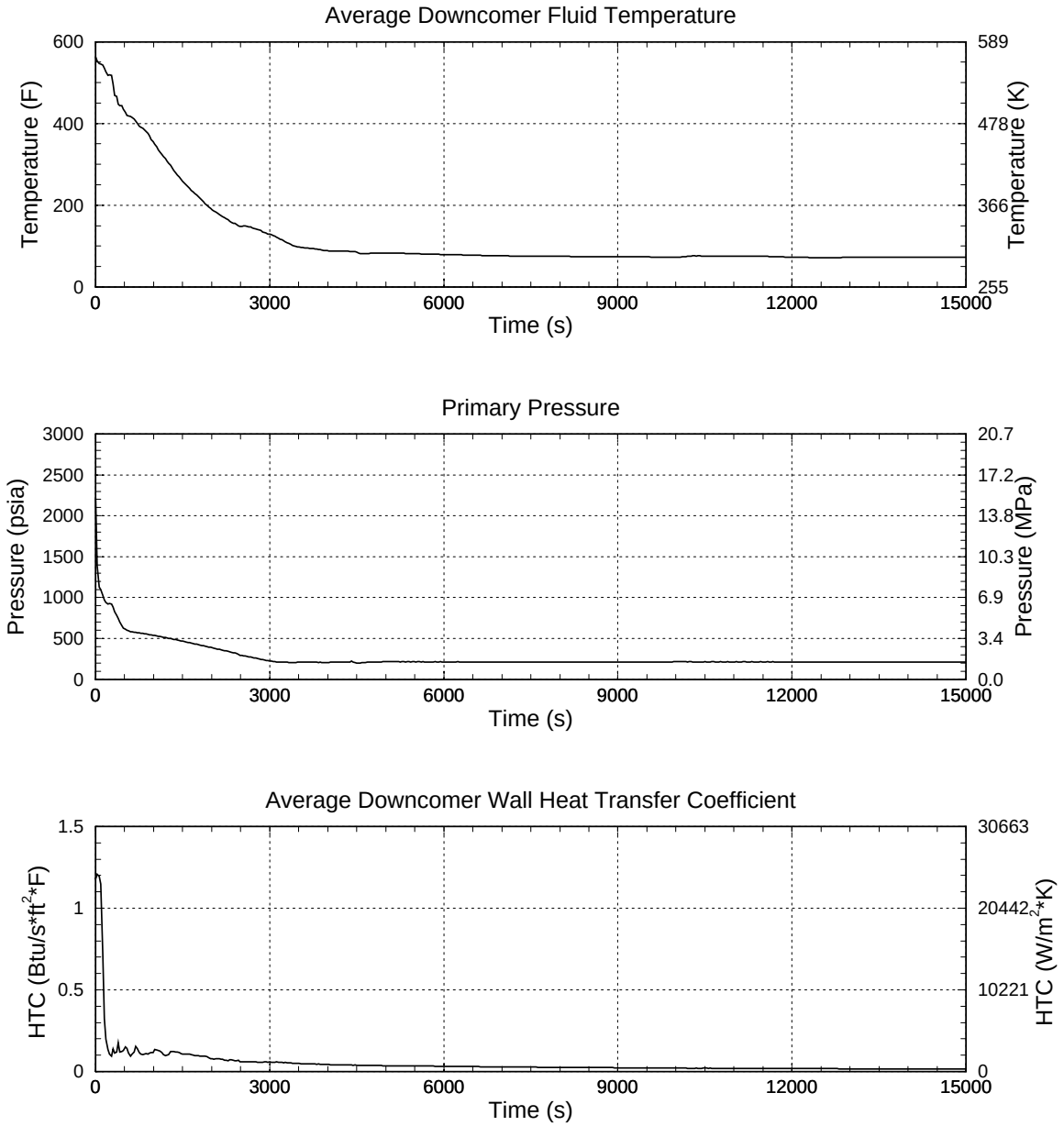


Figure A.2-133: Oconee PTS Results for Case 128

Case Category	LOCA
Primary Failures	10.16 cm (4 inch) cold leg break
Secondary Failures	None
Operator Actions	None
Min DC Temp	316.3 K (109.6°F) at 14070 s
Comments	None.

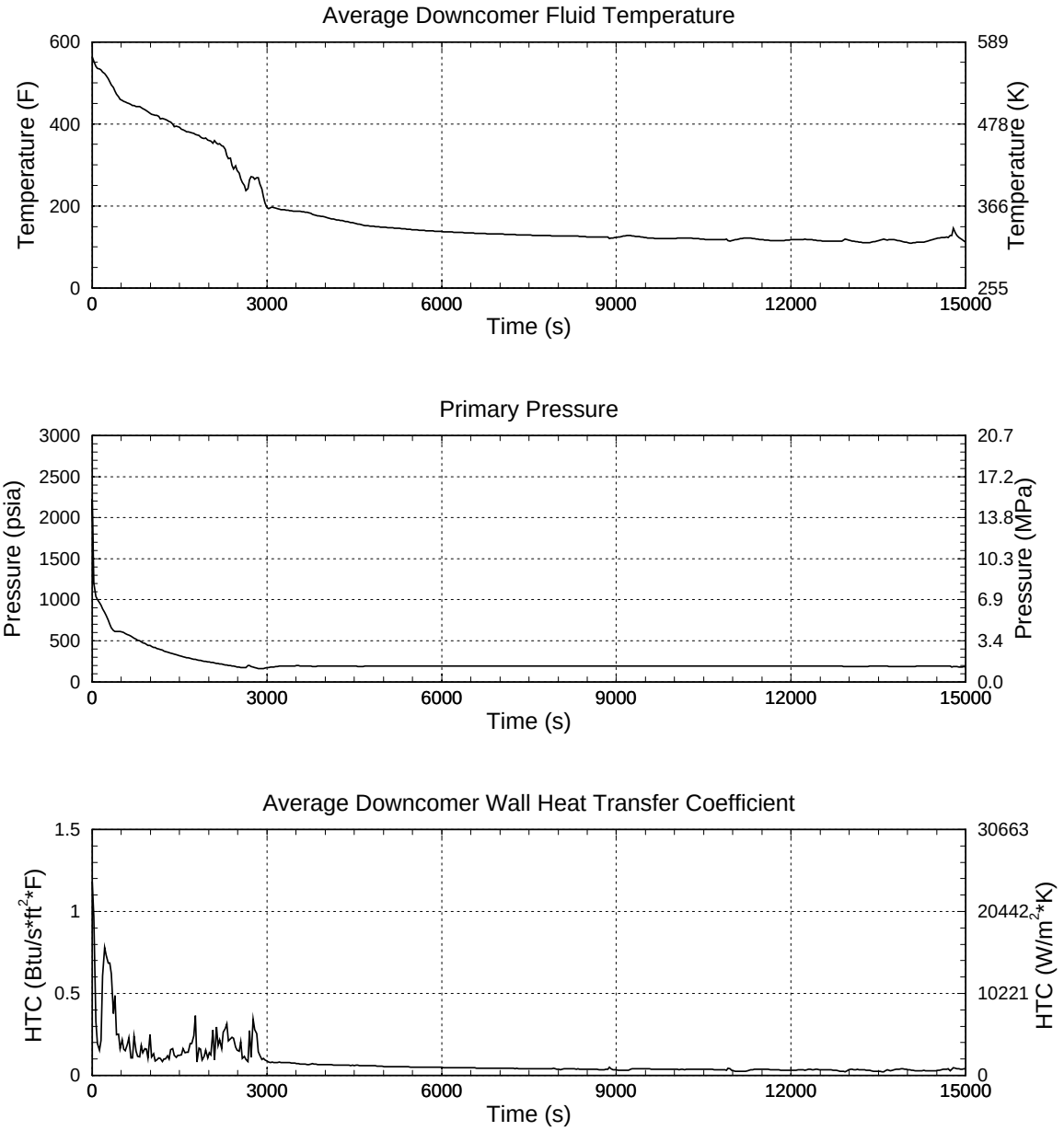


Figure A.2-134: Oconee PTS Results for Case 129

Case Category	LOCA
Primary Failures	14.37 cm (5.656 in) cold leg break
Secondary Failures	None
Operator Actions	None
Min DC Temp	304.8 K (88.9°F) at 10380 s
Comments	None.

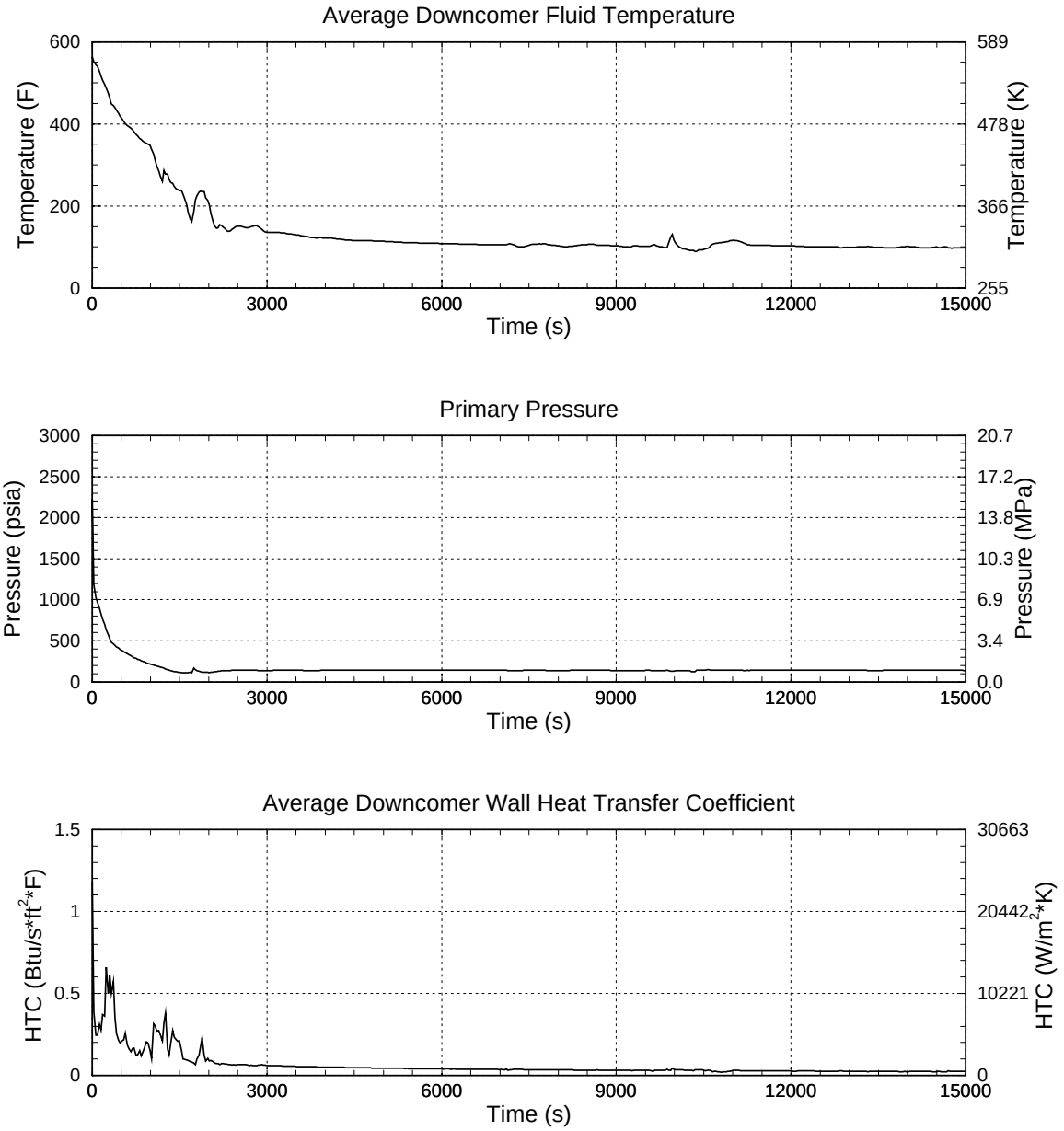


Figure A.2-135: Oconee PTS Results for Case 130

Case Category	LOCA-HZP
Primary Failures	10.16 cm (4 inch) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	294.4 K (70.3°F) at 15000 s
Comments	None.

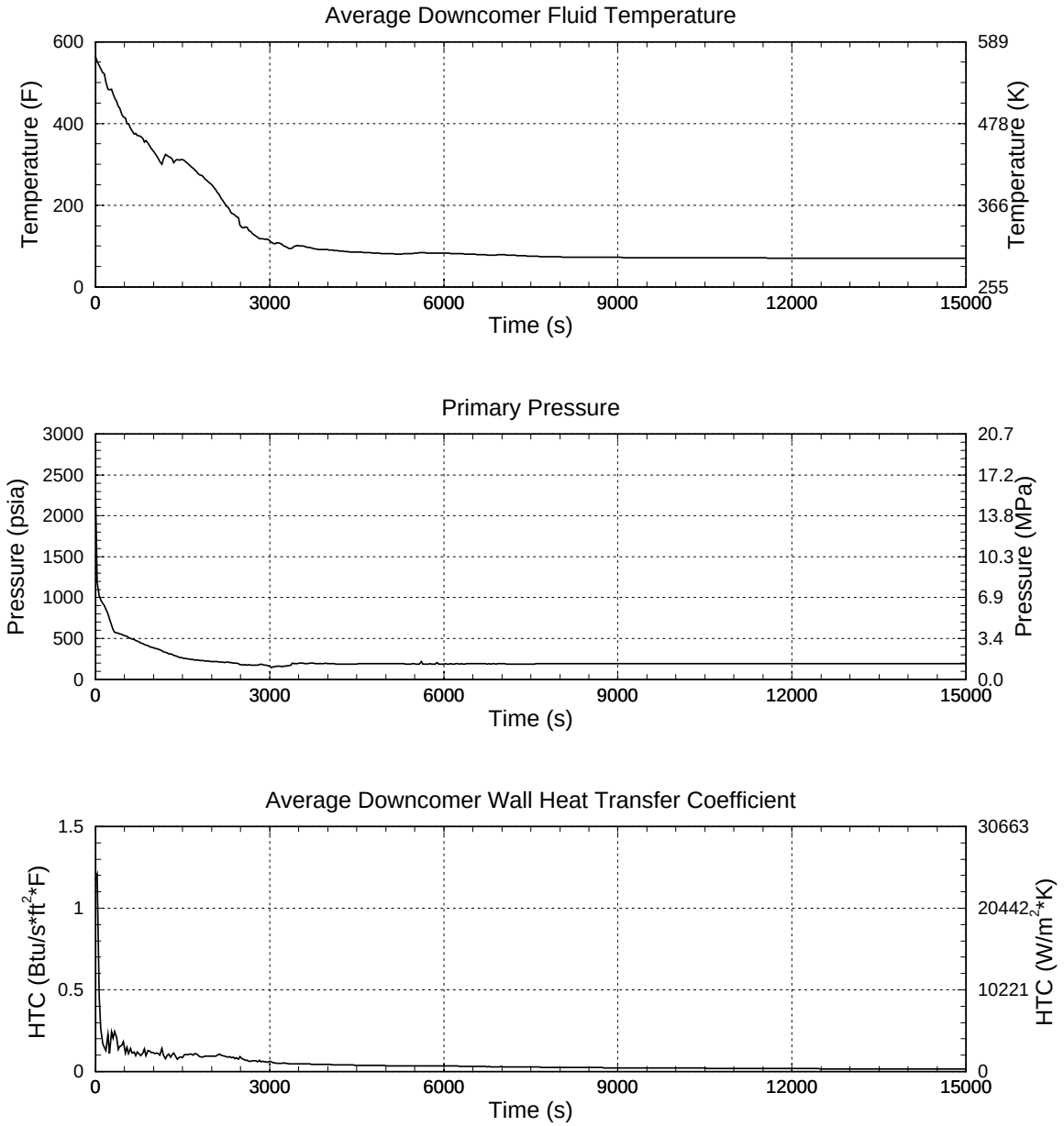


Figure A.2-136: Oconee PTS Results for Case 131

Case Category	LOCA-HZP
Primary Failures	20.32 cm (8 inch) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	294.3 K (70.0°F) at 13800 s
Comments	None.

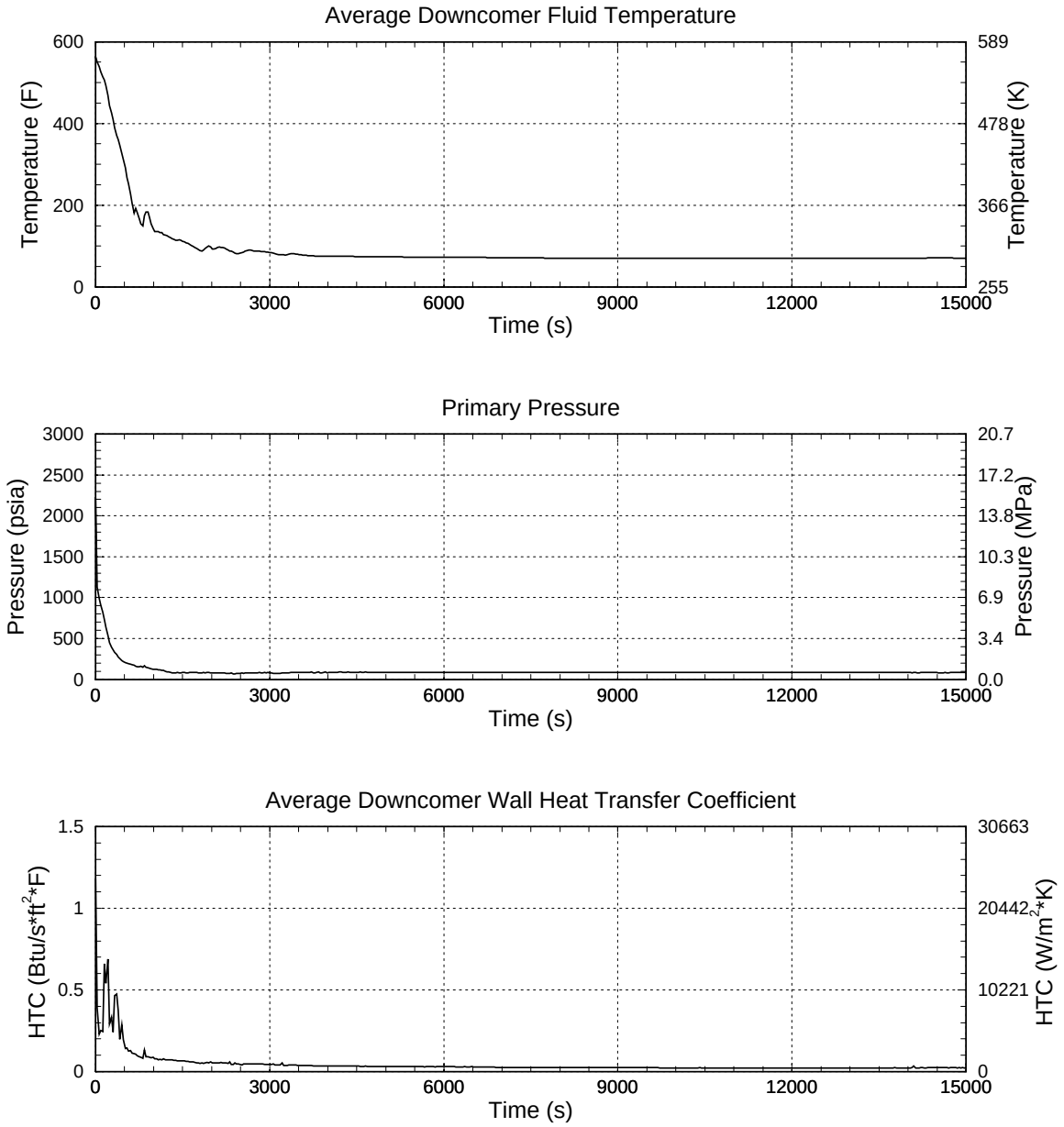


Figure A.2-137: Oconee PTS Results for Case 132

Case Category	LOCA-HiK, HZP
Primary Failures	10.16 cm (4 inch) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	294.8 K (70.9°F) at 15000 s
Comments	None.

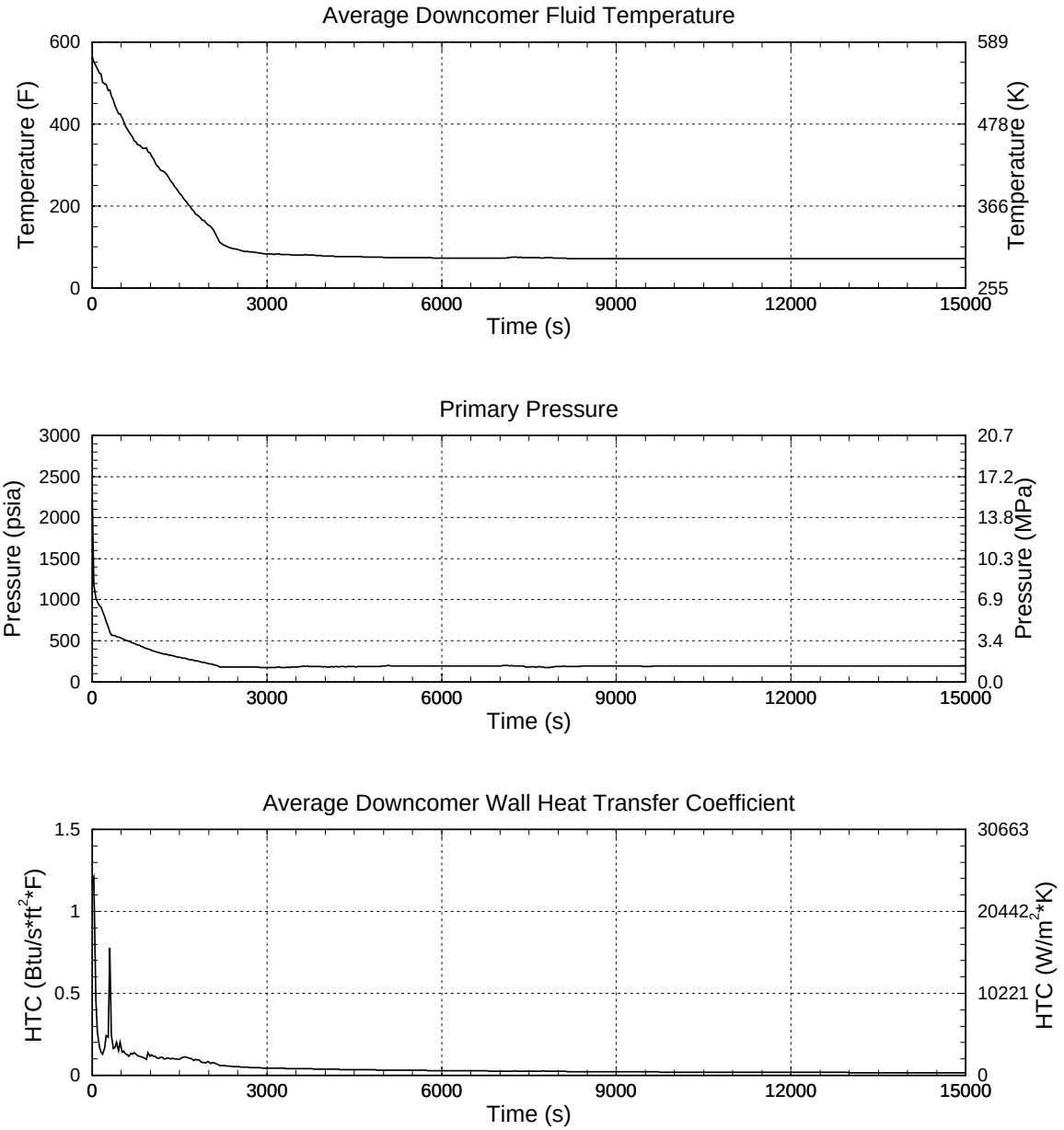


Figure A.2-138: Oconee PTS Results for Case 133

Case Category	LOCA-Hi K, HZP
Primary Failures	20.32 cm (8 inch) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	294.3 K (70.0°F) at 13860 s
Comments	None.

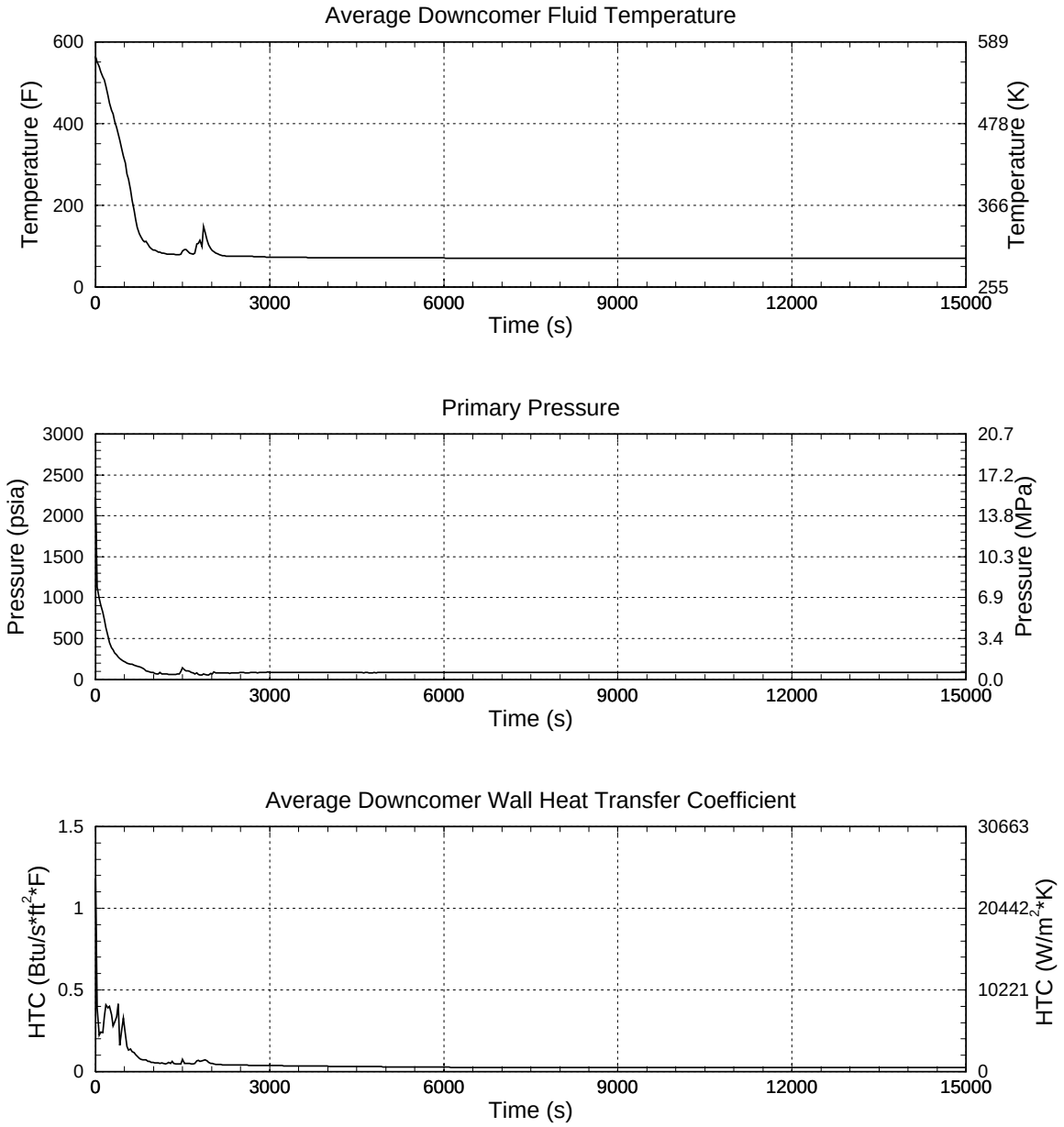


Figure A.2-139: Oconee PTS Results for Case 134

Case Category	LOCA
Primary Failures	8.53 cm (3.35 in) surge line break (Break flow area reduced by 30% from 10.16 cm (4 in) break). Vent valves do not function.
Secondary Failures	None
Operator Actions	None
Min DC Temp	295.1 K (71.5°F) at 14910 s
Comments	None.

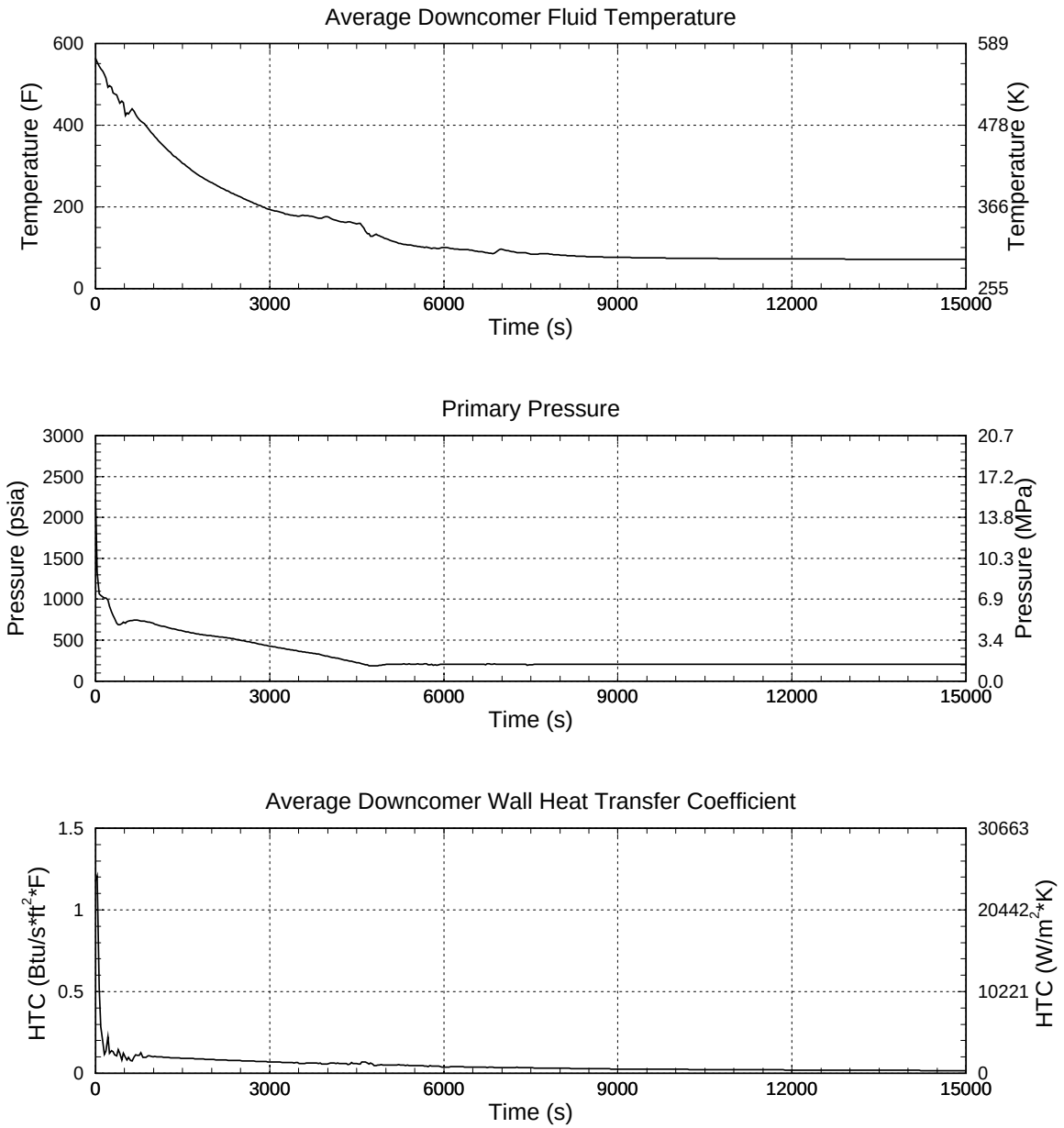


Figure A.2-140: Oconee PTS Results for Case 135

Case Category	LOCA
Primary Failures	4.34 cm (1.71 in) surge line break (Break flow area increased by 30% from 3.81 cm (1.5 in) break). Winter conditions assumed (HPI, LPI temp = 277 K (40°F) and CFT temp = 294 K (70°F)).
Secondary Failures	None
Operator Actions	None
Min DC Temp	361.5 K (191.0°F) at 15000 s
Comments	None.

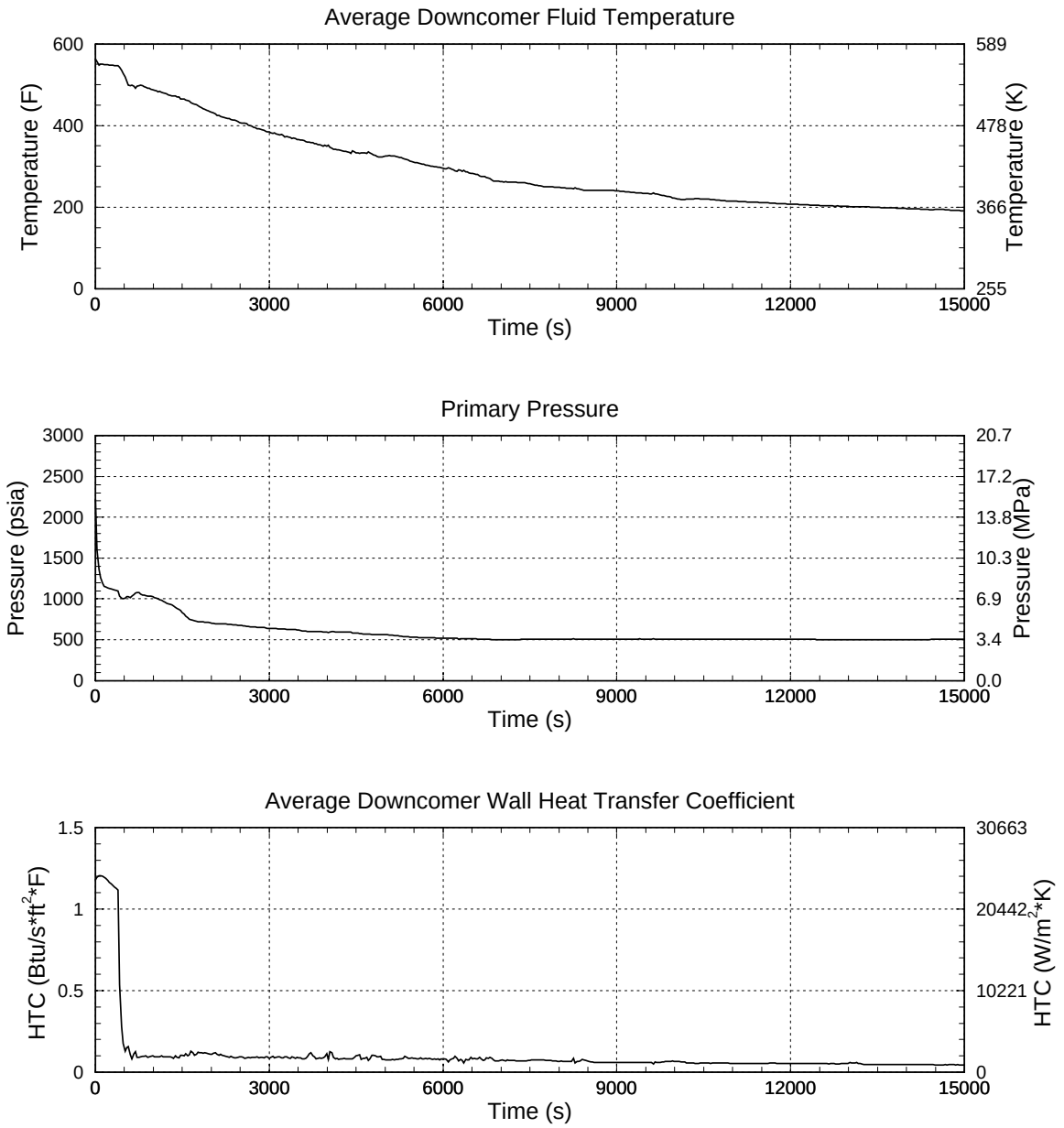


Figure A.2-141: Oconee PTS Results for Case 136

Case Category	TT/RT
Primary Failures	TT/RT with stuck open pzr SRV (valve flow area reduced by 30 percent). Summer conditions assumed (HPI, LPI temp = 302 K (85°F) and CFT temp = 310 K (100°F)). Vent valves do not function.
Secondary Failures	None
Operator Actions	None
Min DC Temp	310.4 K (99.0°F) at 14880 s
Comments	None.

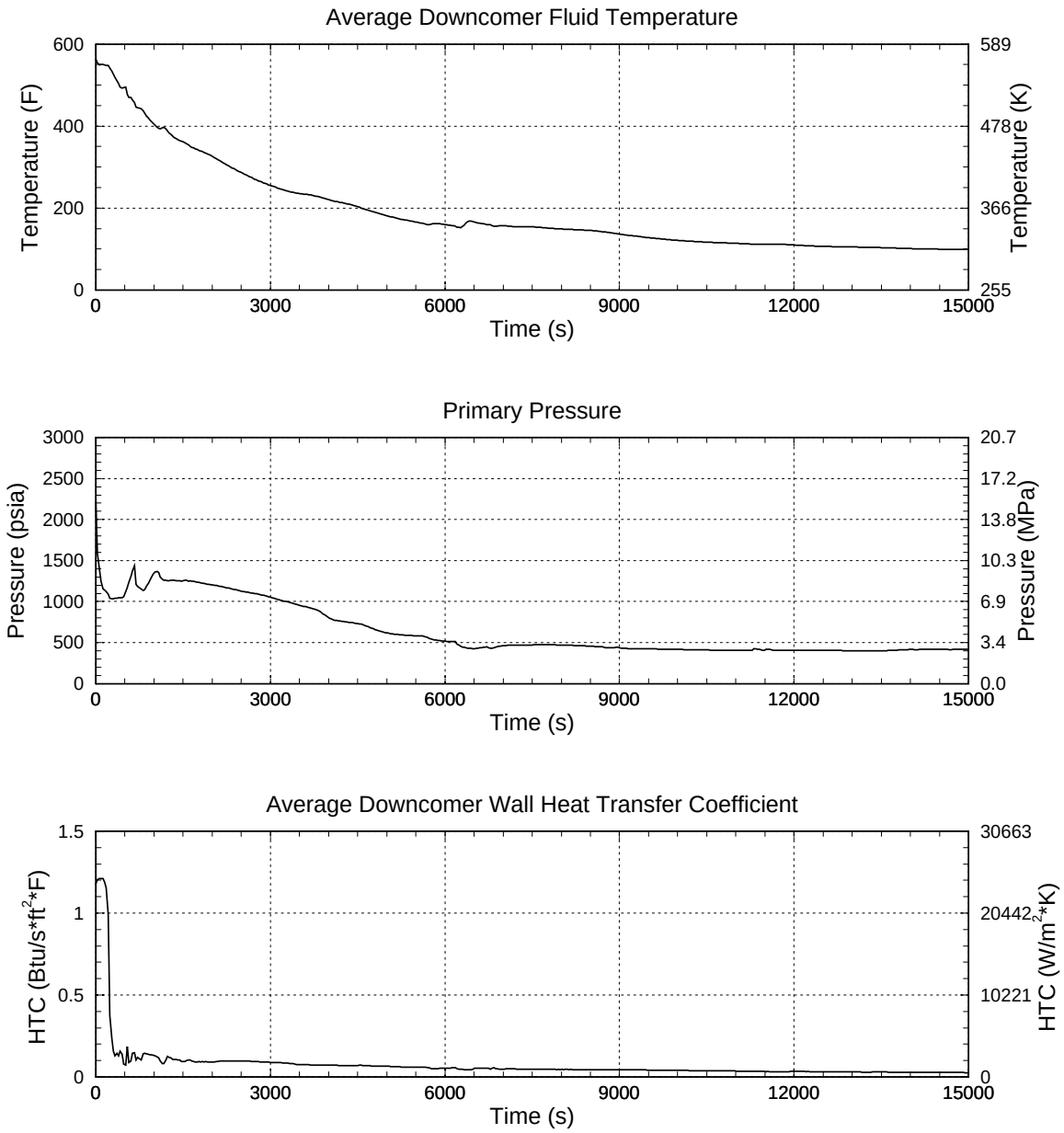


Figure A.2-142: Oconee PTS Results for Case 137

Case Category	TT/RT
Primary Failures	TT/RT with stuck open pzr SRV. Summer conditions assumed (HPI, LPI temp = 302 K (85°F) and CFT temp = 310 K (100°F)).
Secondary Failures	None
Operator Actions	None
Min DC Temp	315.5 K (108.2°F) at 15000 s
Comments	None.

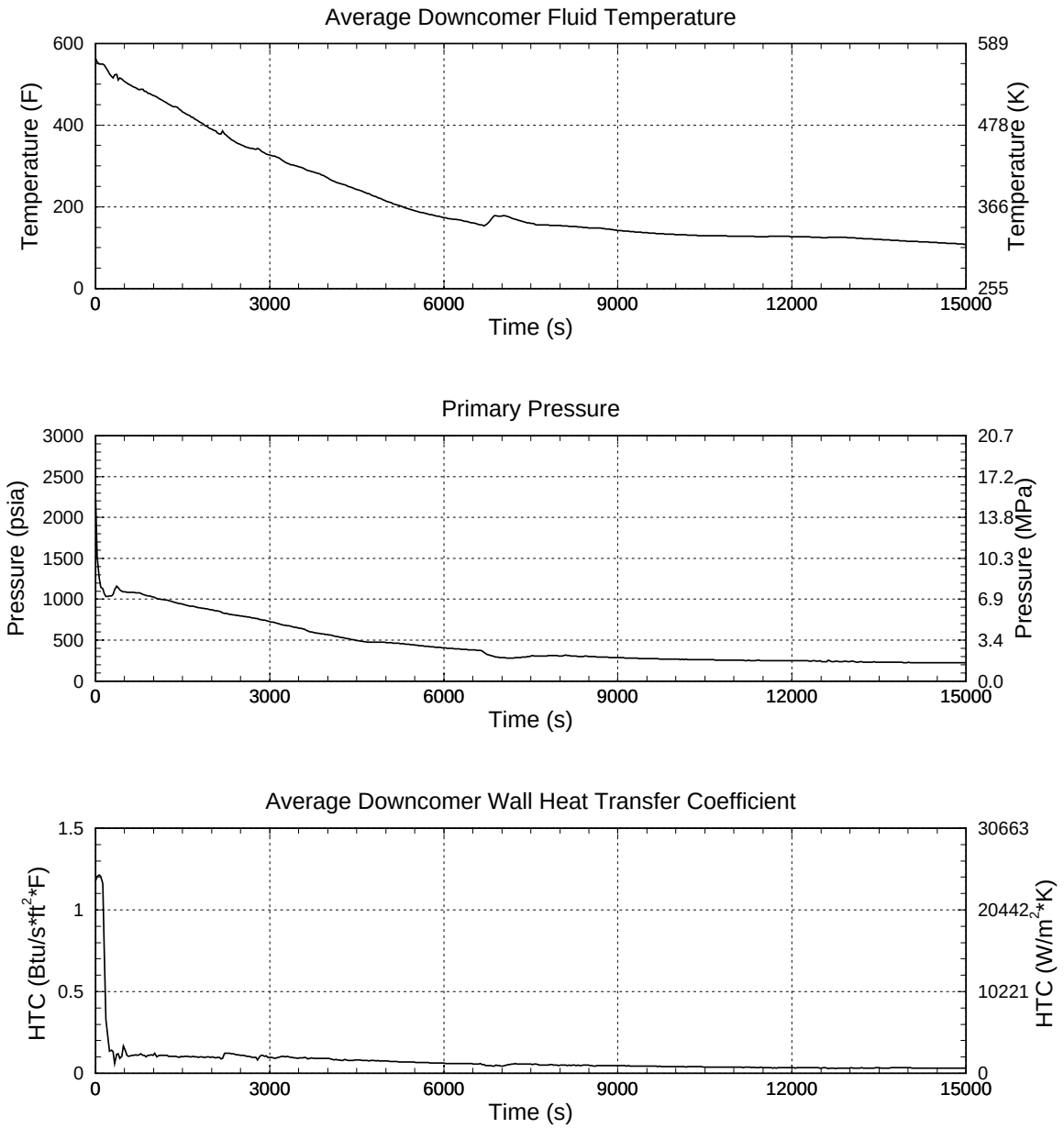


Figure A.2-143: Oconee PTS Results for Case 138

Case Category	TT/RT
Primary Failures	TT/RT with partially stuck open pzr SRV (flow area equivalent to 1.5 in diameter opening). HTC coefficients increased by 1.3.
Secondary Failures	None
Operator Actions	None
Min DC Temp	370.3 K (206.9°F) at 11550 s
Comments	None.

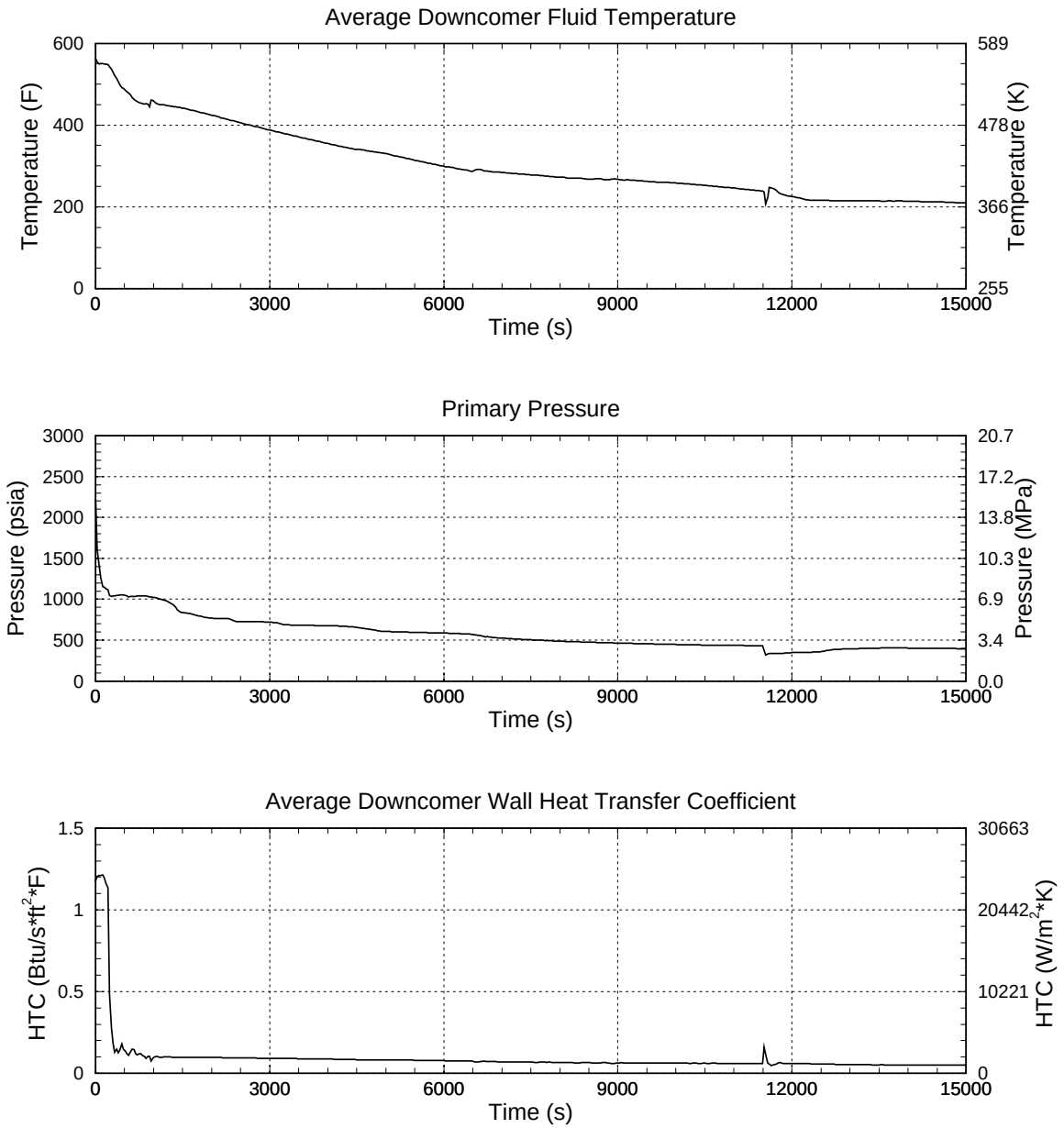


Figure A.2-144: Oconee PTS Results for Case 139

Case Category	TT/RT
Primary Failures	TT/RT with stuck open pzr SRV. SRV assumed to reclose at 3000 secs. Operator does not throttle HPI.
Secondary Failures	None
Operator Actions	None
Min DC Temp	361.9 K (191.7°F) at 15000 s
Comments	None.

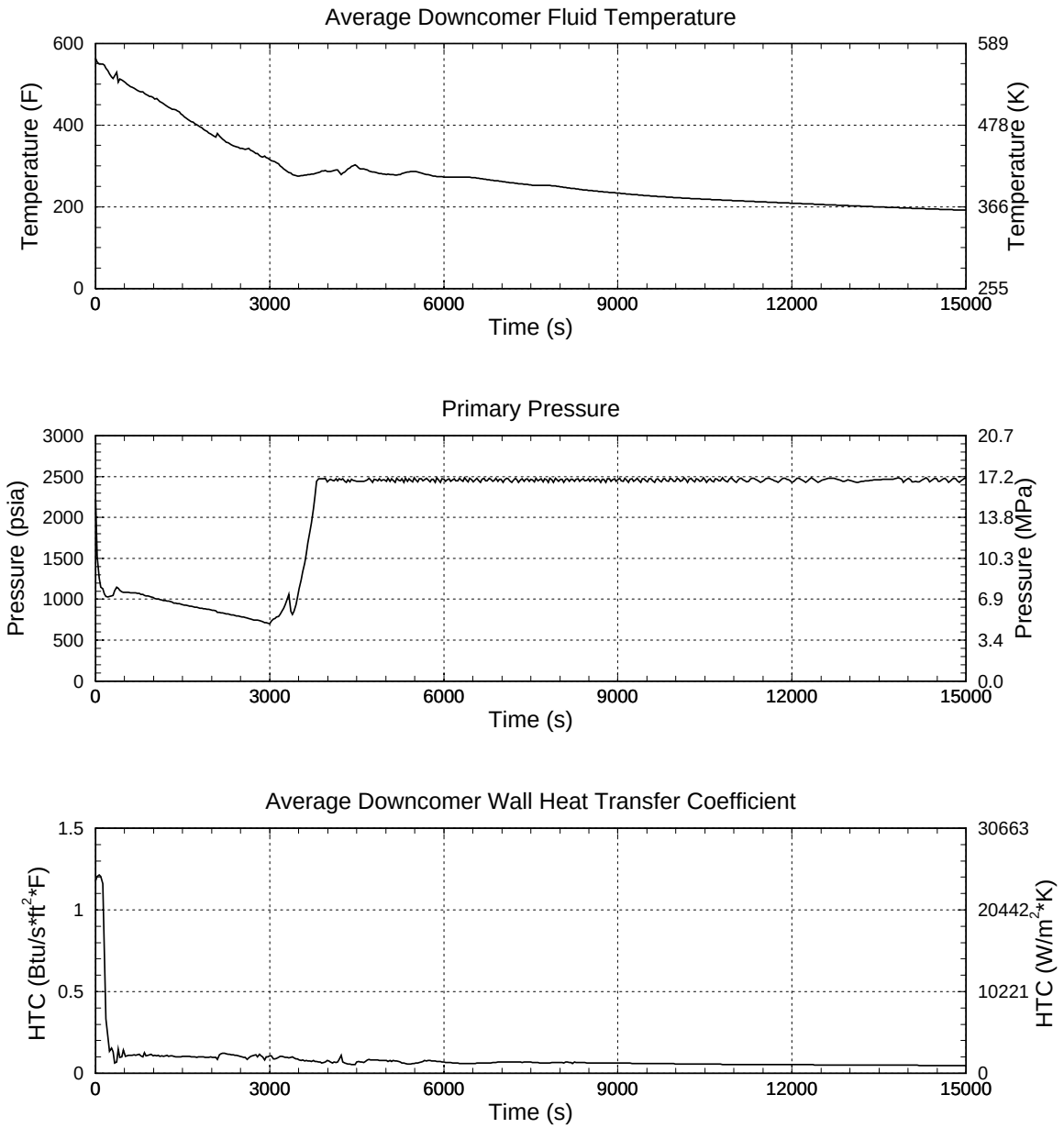


Figure A.2-145: Oconee PTS Results for Case 140

Case Category	LOCA-HiK
Primary Failures	8.19 cm (3.22 in) surge line break (Break flow area increased by 30% from 7.18 cm (2.828 in) break).
Secondary Failures	None
Operator Actions	None
Min DC Temp	295.7 K (72.6°F) at 15000 s
Comments	None.

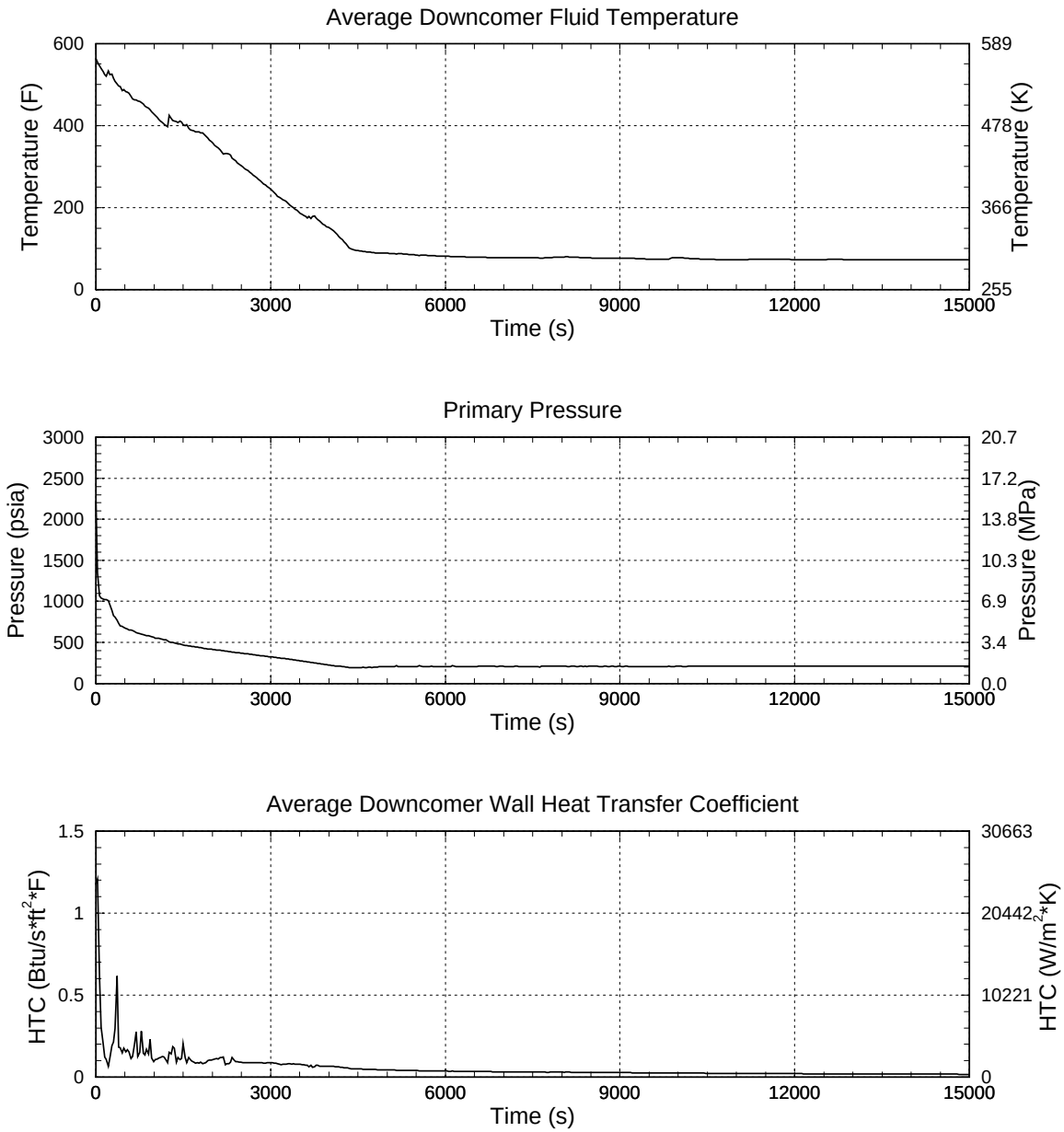


Figure A.2-146: Oconee PTS Results for Case 141

Case Category	LOCA-HiK
Primary Failures	6.01 cm (2.37 in) surge line break (Break flow area decreased by 30% from 7.18 cm (2.828 in) break).
Secondary Failures	None
Operator Actions	None
Min DC Temp	299.0 K (78.6°F) at 15000 s
Comments	None.

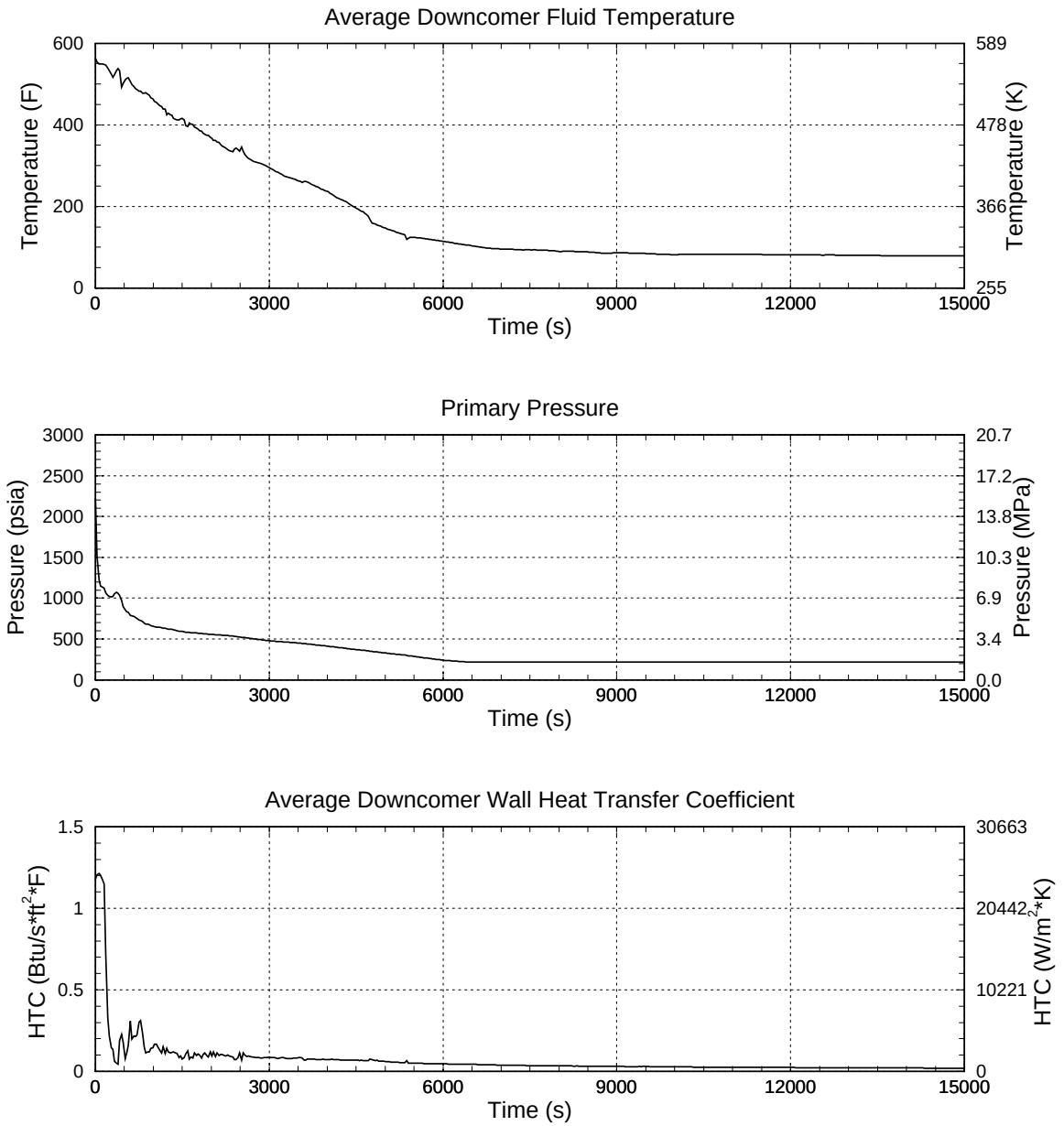


Figure A.2-147: Oconee PTS Results for Case 142

Case Category	LOCA-HiK
Primary Failures	7.18 cm (2.828 in) cold leg break.
Secondary Failures	None
Operator Actions	None
Min DC Temp	298.6 K (77.8°F) at 15000 s
Comments	None.

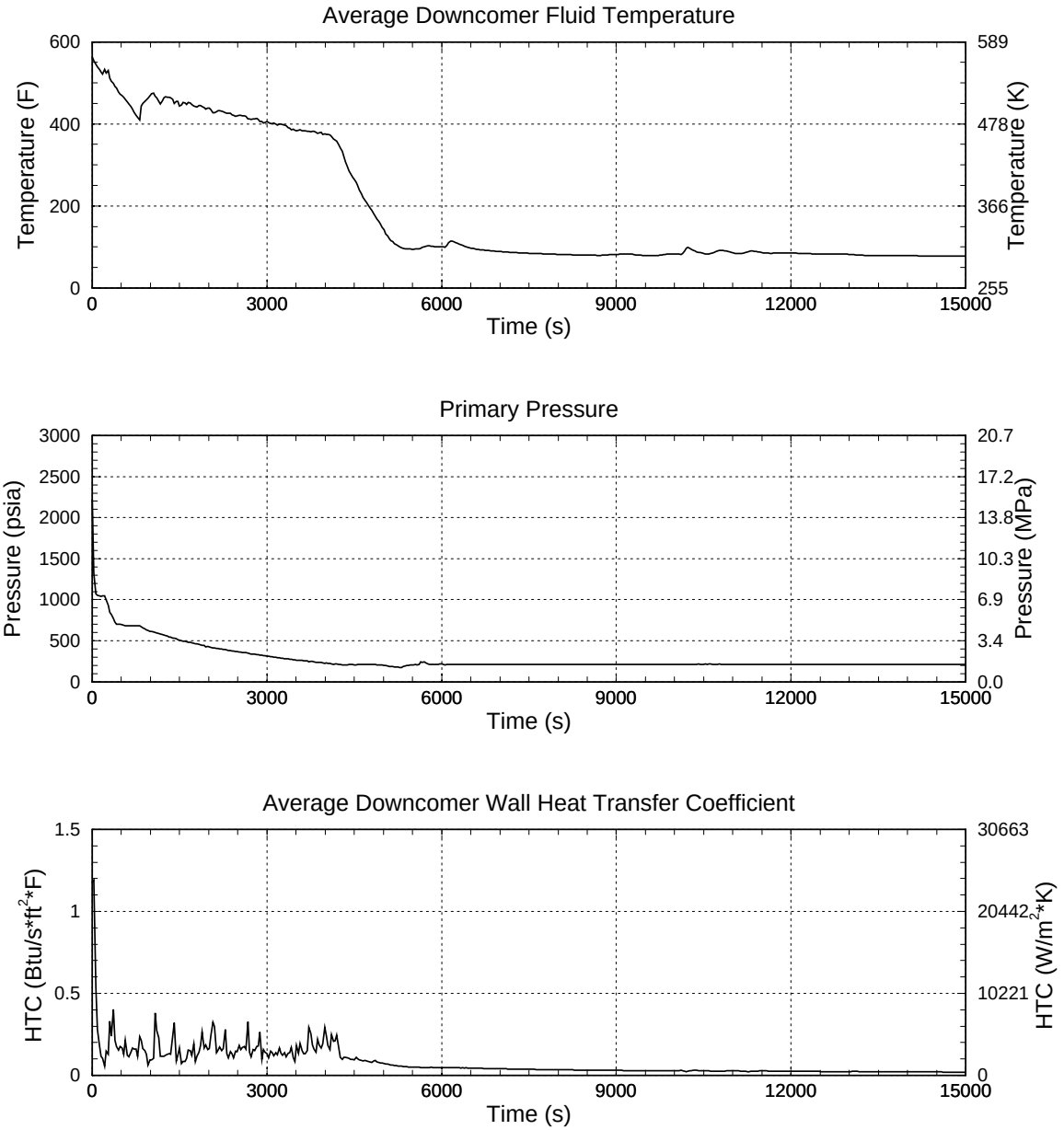


Figure A.2-148: Oconee PTS Results for Case 143

Case Category	LOCA-HiK
Primary Failures	8.53 cm (3.35 in) surge line break (Break flow area reduced by 30% from 10.16 cm (4 in) break). Vent valves do not function.
Secondary Failures	None
Operator Actions	None
Min DC Temp	294.8 K (71.0°F) at 15000 s
Comments	None.

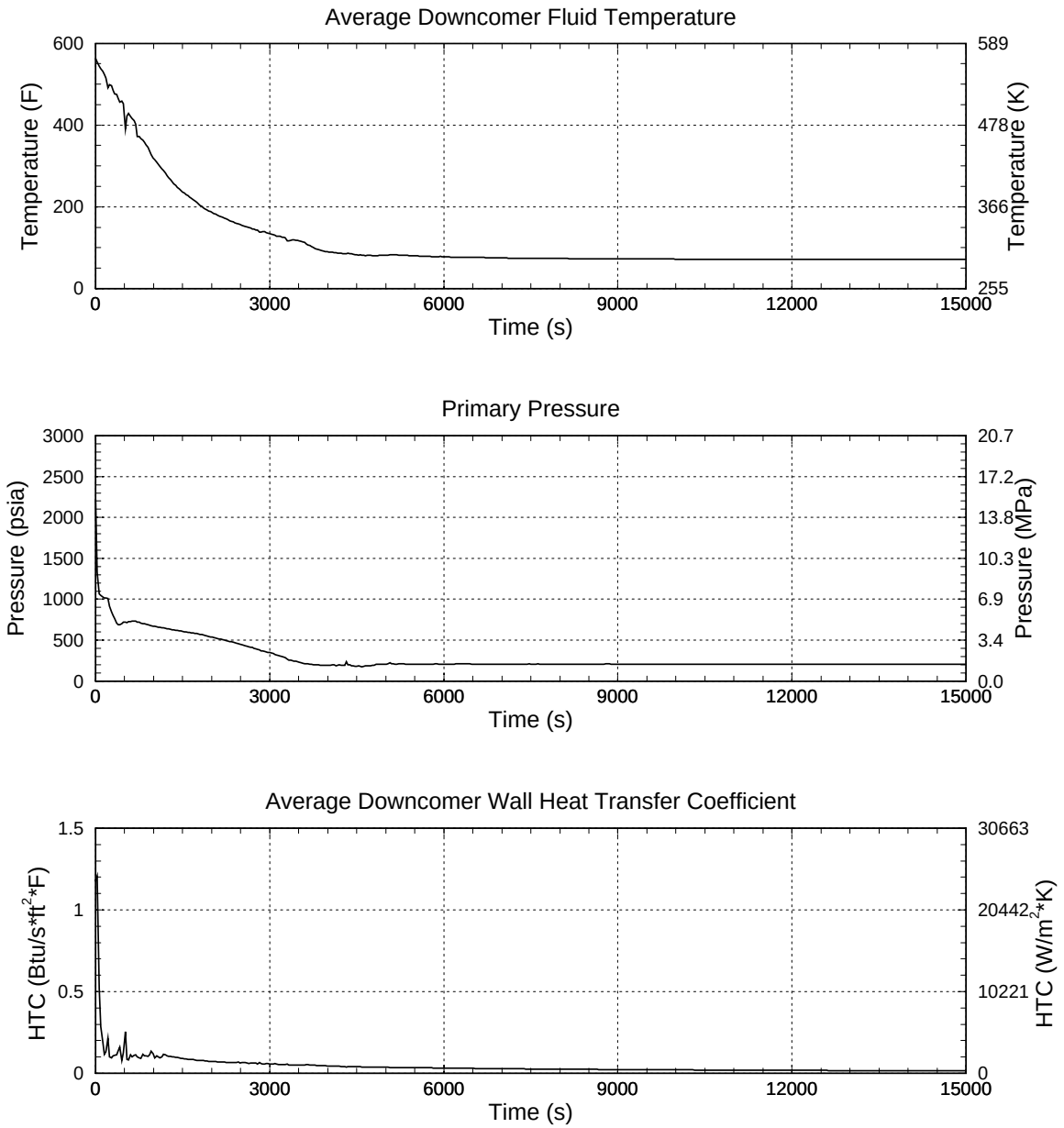


Figure A.2-149: Oconee PTS Results for Case 144

Case Category	LOCA-HiK
Primary Failures	4.34 cm (1.71 in) surge line break (Break flow area increased by 30% from 3.81 cm (1.5 in) break). Winter conditions assumed (HPI, LPI temp = 277 K (40°F) and CFT temp = 294 K (70°F)).
Secondary Failures	None
Operator Actions	None
Min DC Temp	361.8 K (191.6°F) at 15000 s
Comments	None.

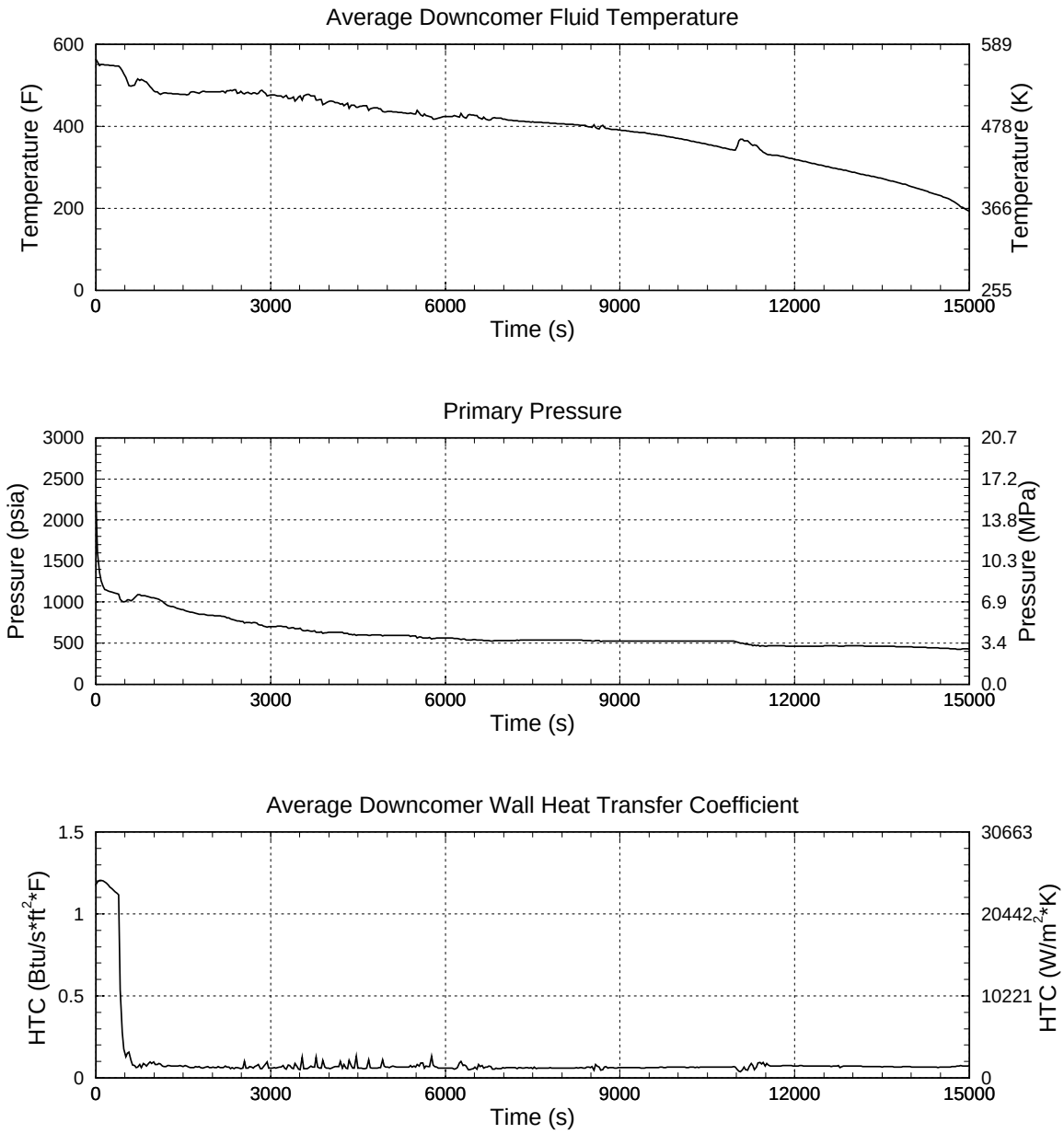


Figure A.2-150: Oconee PTS Results for Case 145

Case Category	TT/RT-HiK
Primary Failures	TT/RT with stuck open pzr SRV (valve flow area reduced by 30 percent). Summer conditions assumed (HPI, LPI temp = 302 K (85°F) and CFT temp = 310 K (100°F)). Vent valves do not function.
Secondary Failures	None
Operator Actions	None
Min DC Temp	309.6 K (97.7°F) at 14040 s
Comments	None.

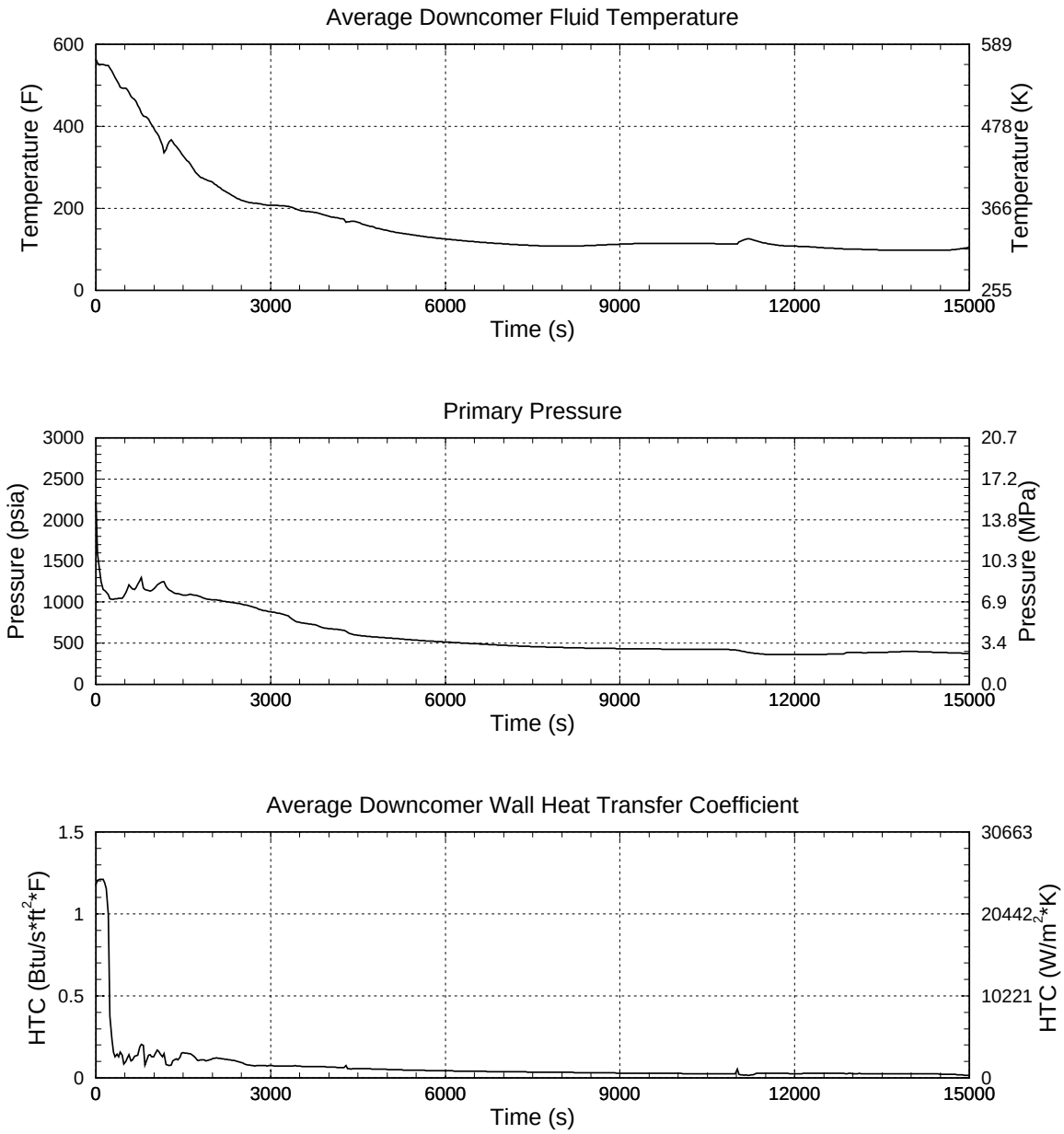


Figure A.2-151: Oconee PTS Results for Case 146

Case Category	TT/RT-Hi K
Primary Failures	TT/RT with stuck open pzr SRV. Summer conditions assumed (HPI, LPI temp = 302 K (85°F) and CFT temp = 310 K (100°F)).
Secondary Failures	None
Operator Actions	None
Min DC Temp	308.1 K (94.9°F) at 15000 s
Comments	None.

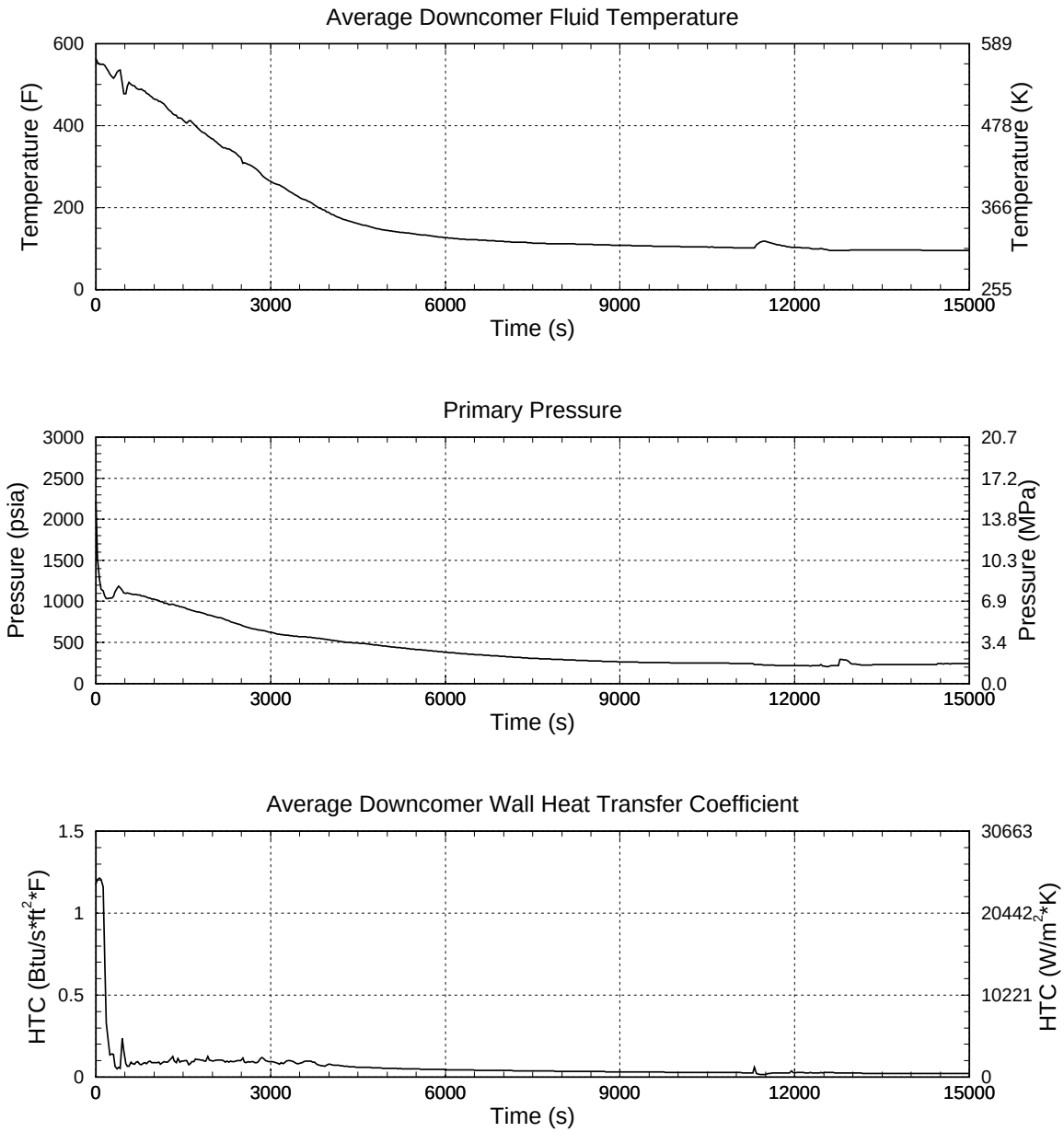


Figure A.2-152: Oconee PTS Results for Case 147

Case Category	TT/RT-Hi K
Primary Failures	TT/RT with partially stuck open pzr SRV (flow area equivalent to 1.5 in diameter opening). HTC coefficients increased by 1.3.
Secondary Failures	None
Operator Actions	None
Min DC Temp	365.1 K (197.6°F) at 13710 s
Comments	None.

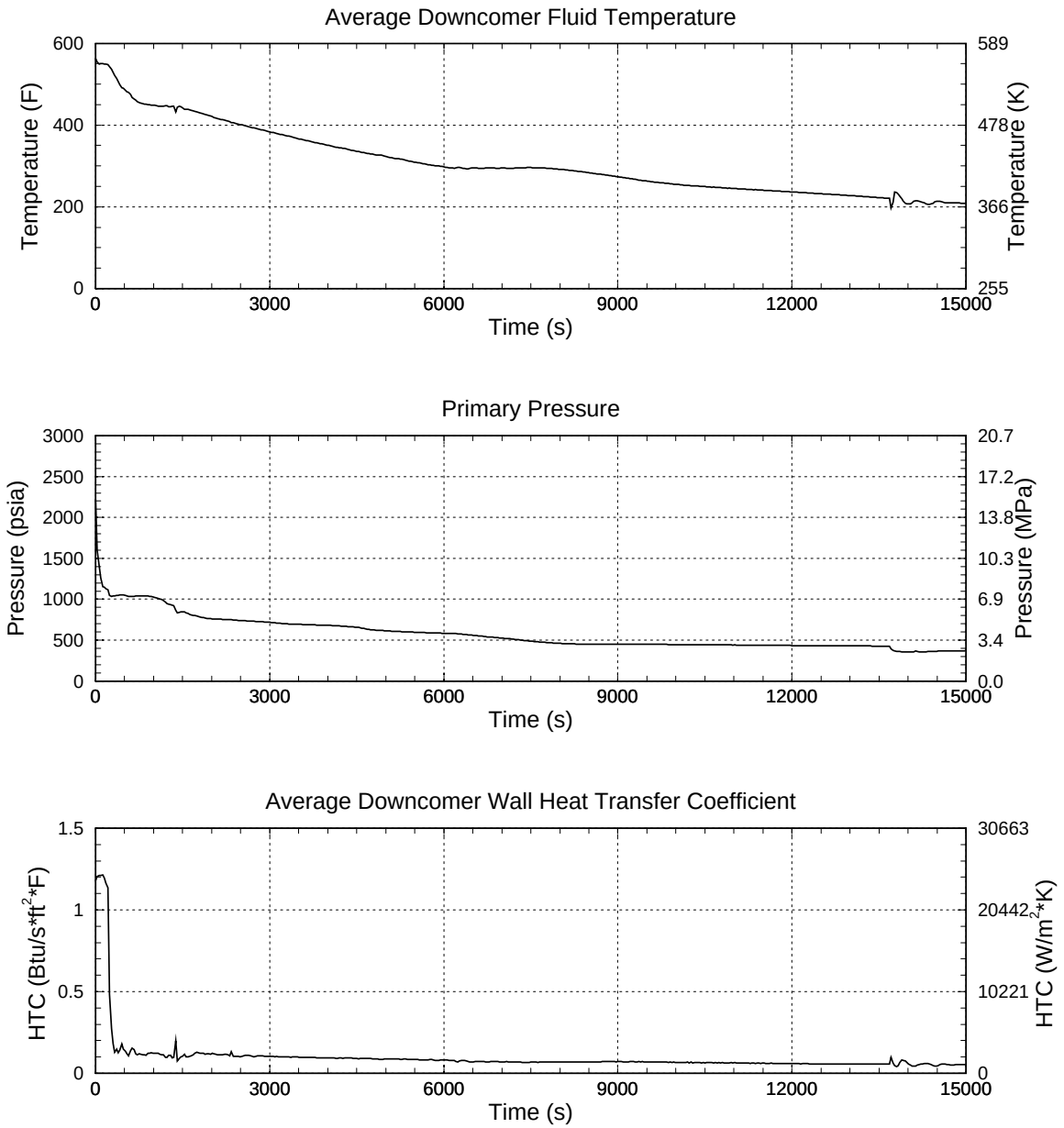


Figure A.2-153: Oconee PTS Results for Case 148

Case Category	TT/RT-Hi K
Primary Failures	TT/RT with stuck open pzr SRV. SRV assumed to reclose at 3000 secs. Operator does not throttle HPI.
Secondary Failures	None
Operator Actions	None
Min DC Temp	365.2 K (197.7°F) at 15000 s
Comments	None.

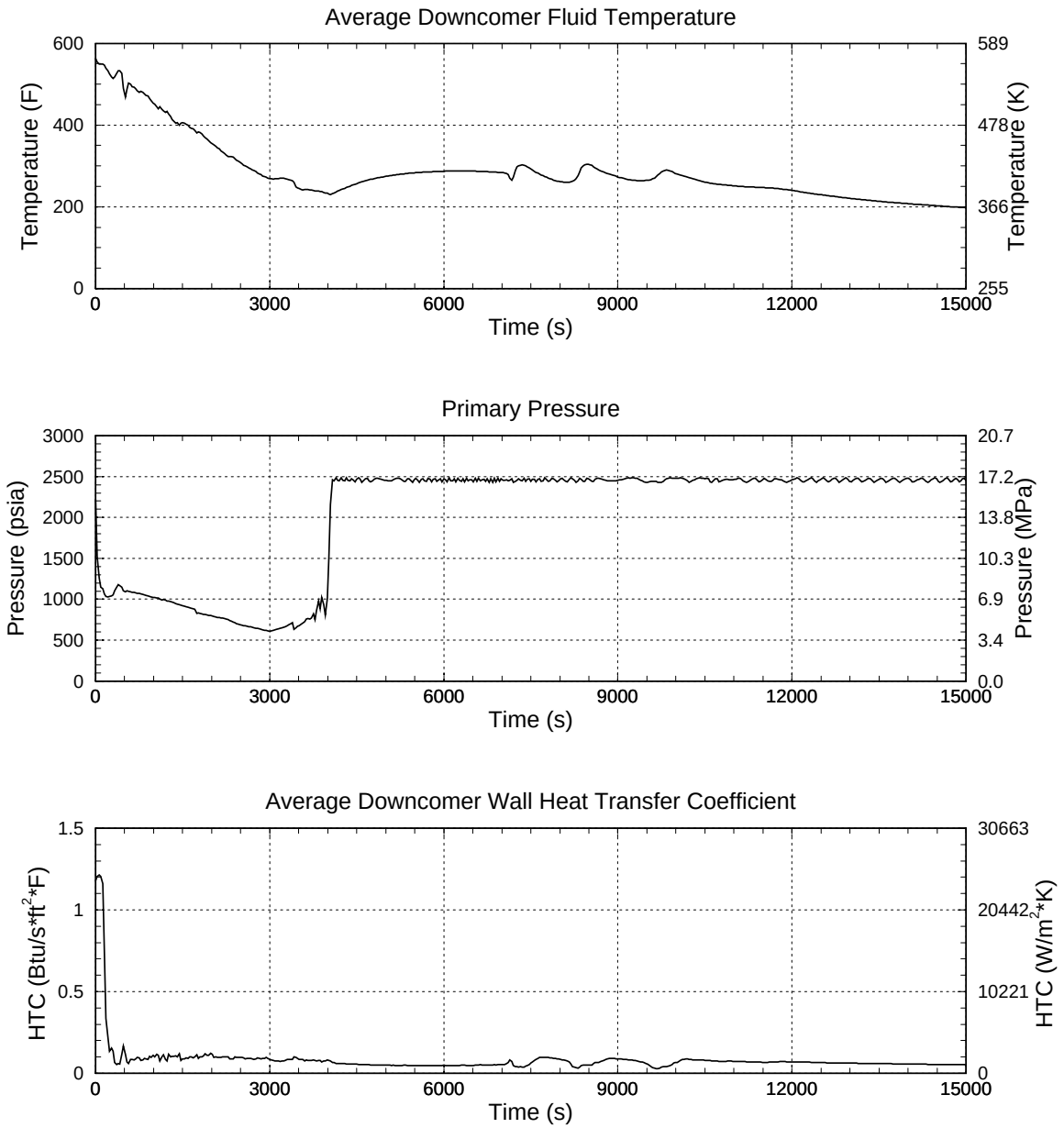


Figure A.2-154: Oconee PTS Results for Case 149

Case Category	LOCA
Primary Failures	14.37 cm (5.656 in) surge line break. ECC suction switch to the containment sump included in the analysis.
Secondary Failures	None
Operator Actions	None
Min DC Temp	305.8 K (90.8°F) at 2820 s
Comments	None.

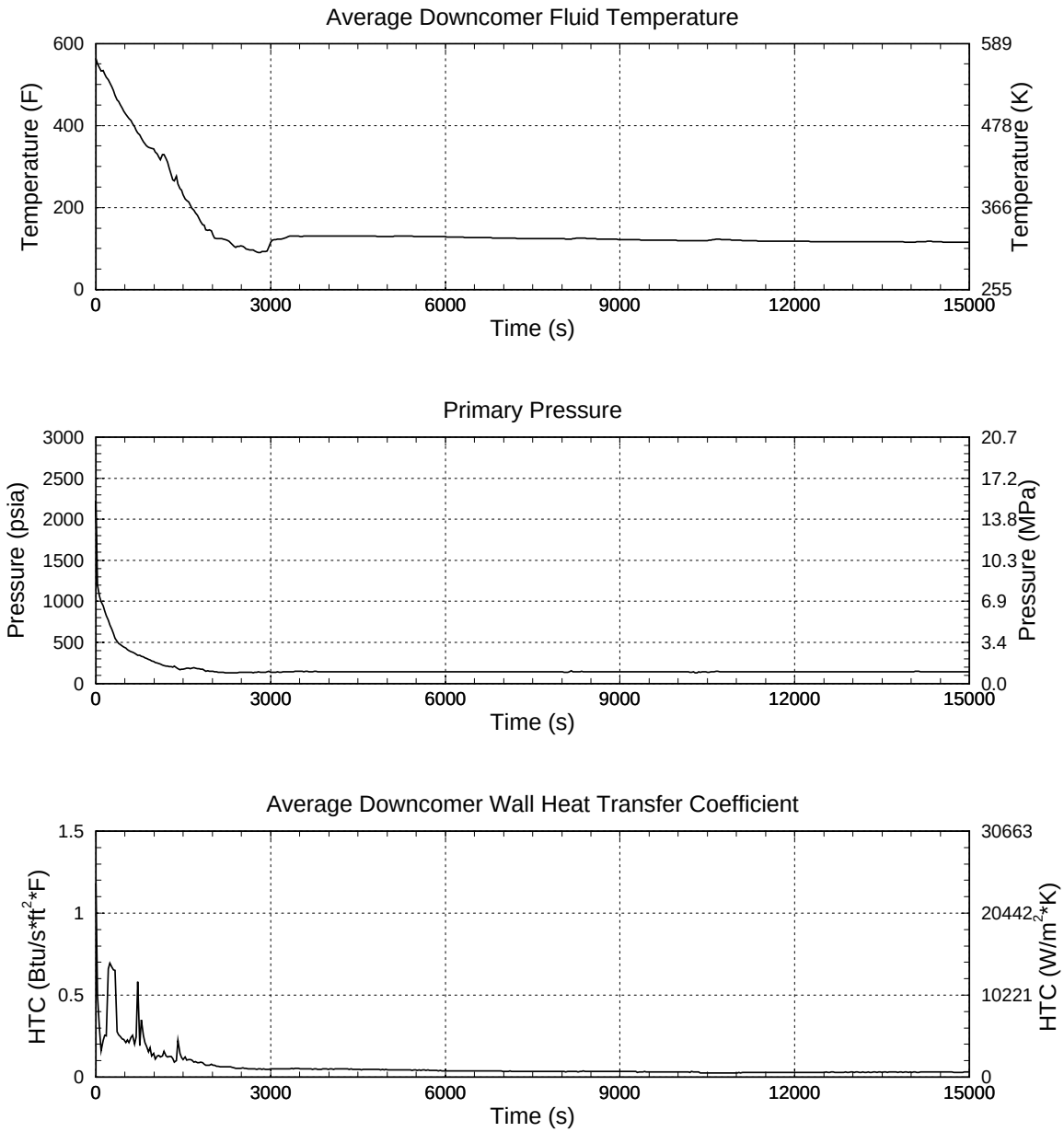


Figure A.2-155: Oconee PTS Results for Case 150

Case Category	LOCA
Primary Failures	20.32 cm (8 inch) surge line break. ECC suction switch to the containment sump included in the analysis.
Secondary Failures	None
Operator Actions	None
Min DC Temp	305.1 K (89.5°F) at 2010 s
Comments	None.

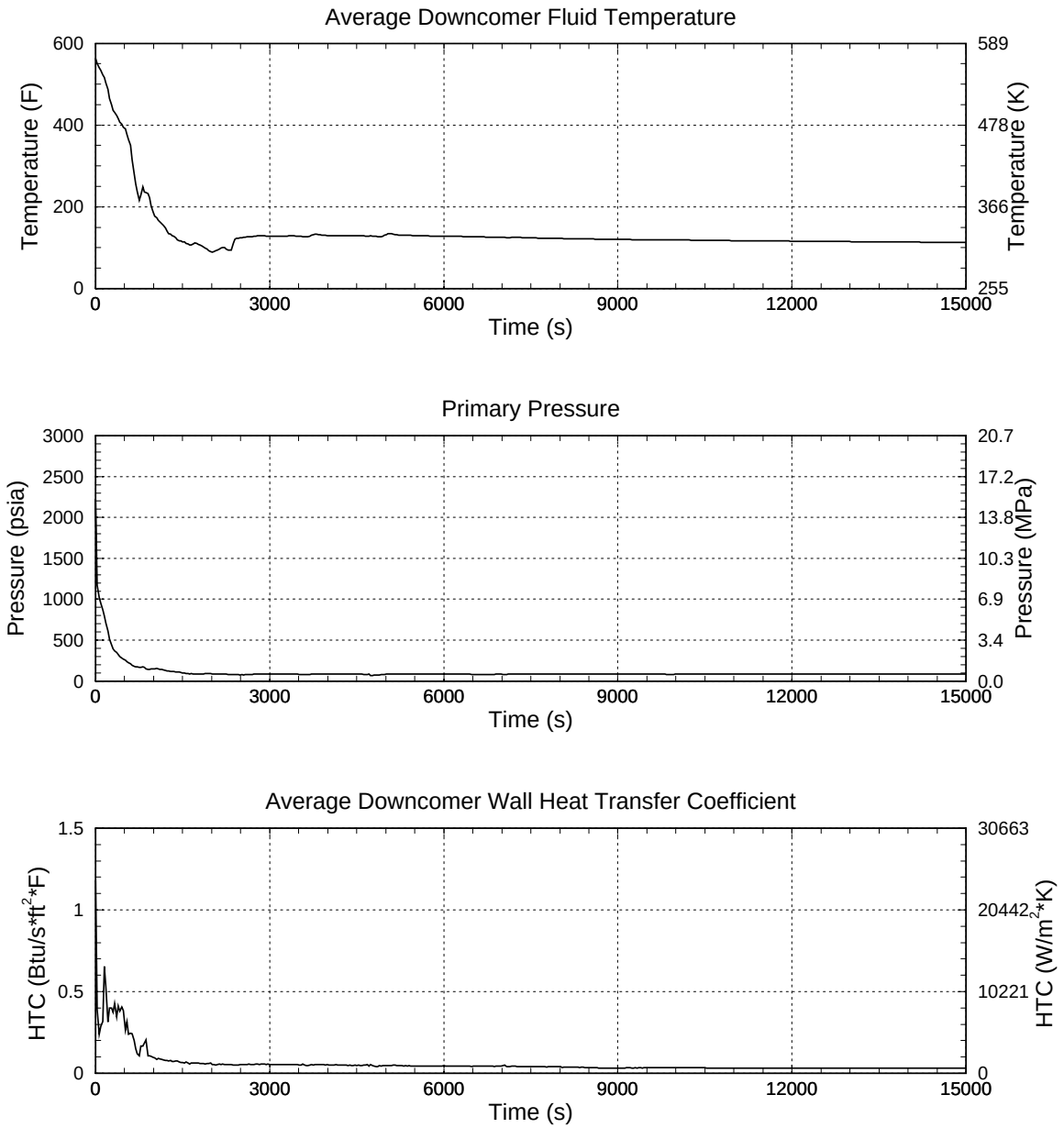


Figure A.2-156: Oconee PTS Results for Case 151

Case Category	LOCA-Hi K
Primary Failures	7.183 cm (2.828 in) surge line break. ECC suction switch to the containment sump included in the analysis.
Secondary Failures	None
Operator Actions	None
Min DC Temp	322.2 K (120.2°F) at 15000 s
Comments	None.

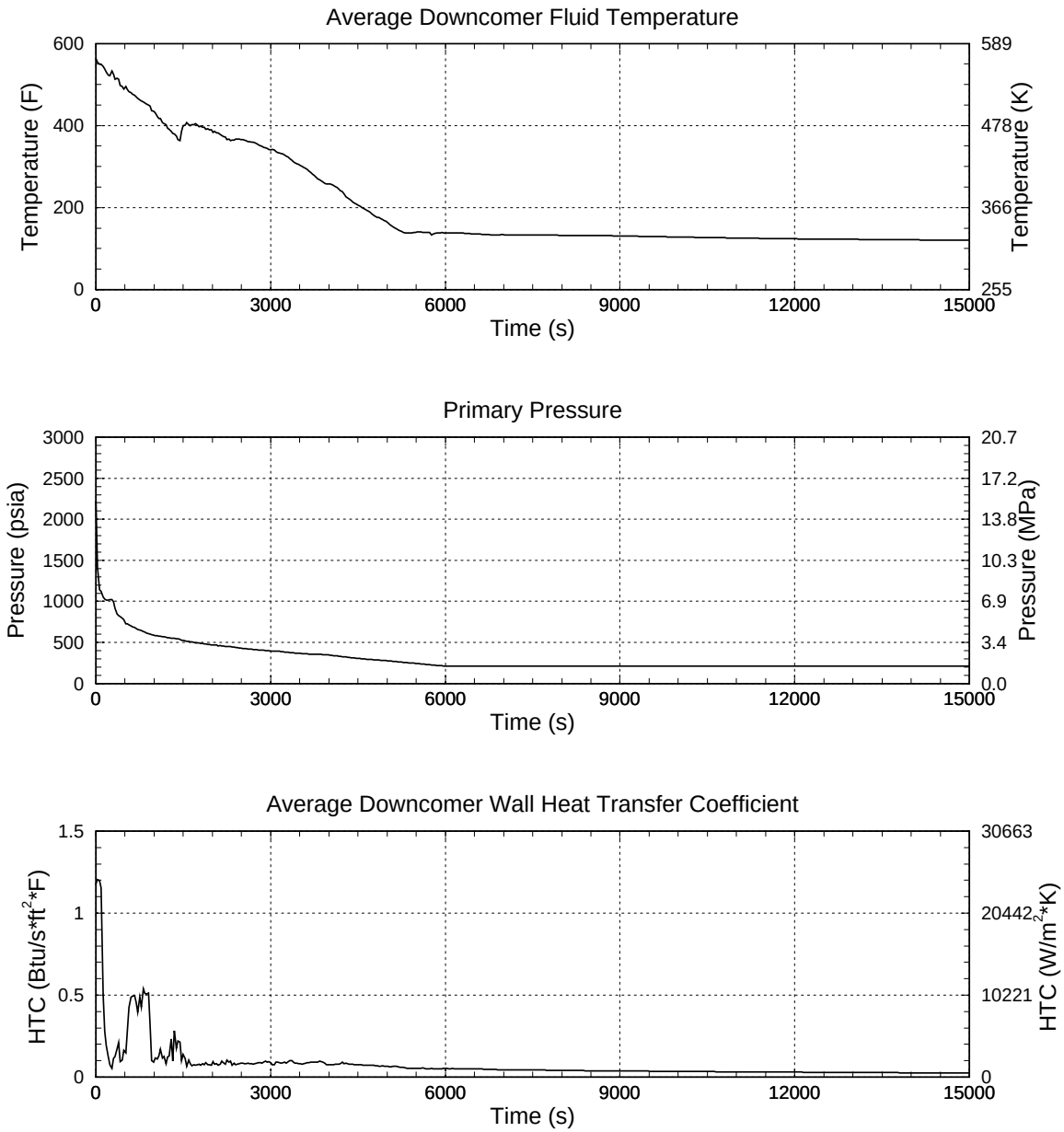


Figure A.2-157: Oconee PTS Results for Case 152

Case Category	LOCA-HiK
Primary Failures	8.19 cm (3.22 in) surge line break (Break flow area increased by 30% from 7.18 cm (2.828 in) break). ECC suction switch to the containment sump included in the analysis.
Secondary Failures	None
Operator Actions	None
Min DC Temp	305.7 K (90.6°F) at 4770 s
Comments	None.

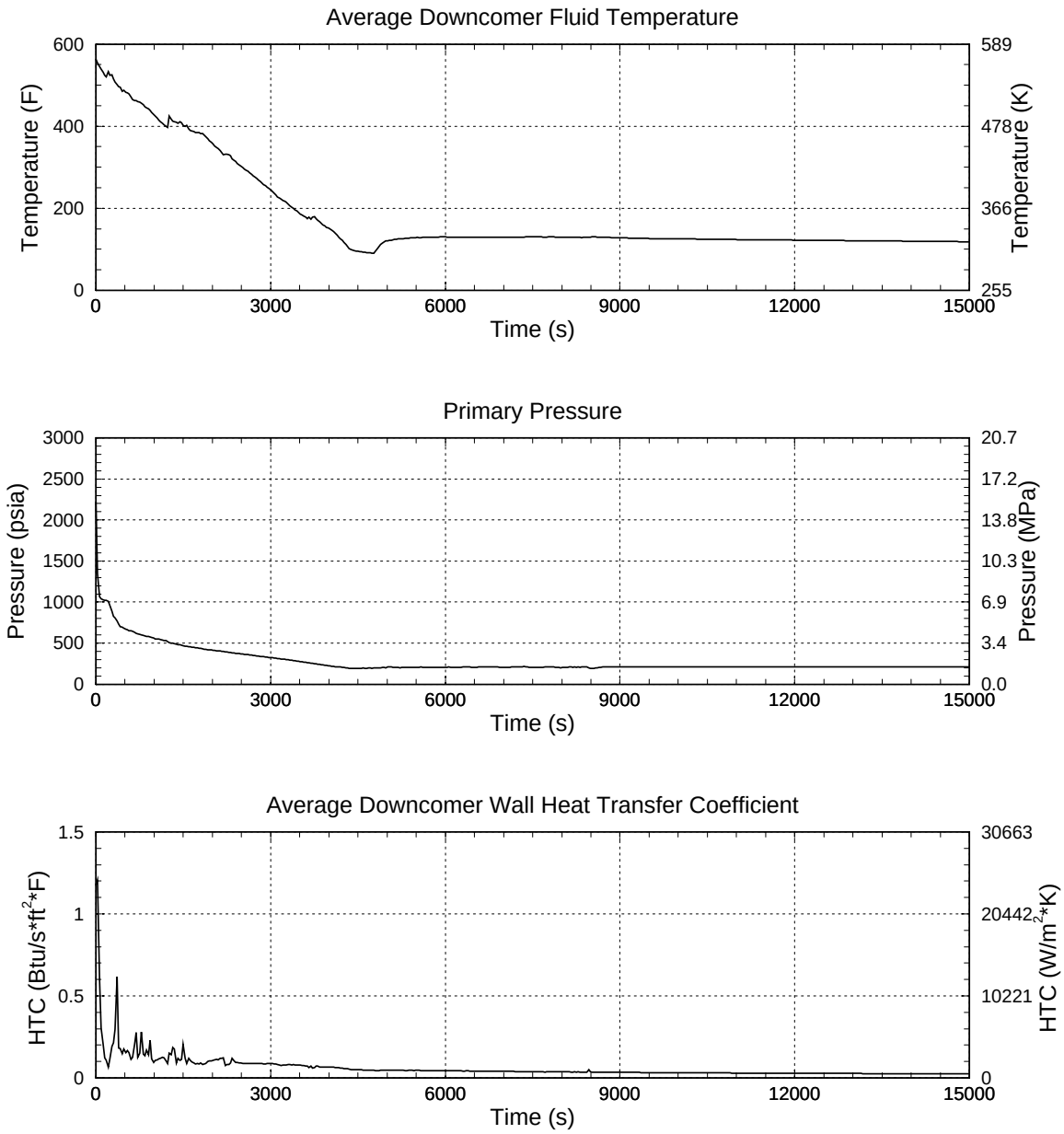


Figure A.2-158: Oconee PTS Results for Case 153

Case Category	LOCA-HiK
Primary Failures	8.53 cm (3.36 in) surge line break (Break flow area reduced by 30% from 10.16 cm (4 in) break). Vent valves do not function. ECC suction switch to the containment sump included in the analysis.
Secondary Failures	None
Operator Actions	None
Min DC Temp	301.8 K (83.6°F) at 4440 s
Comments	None.

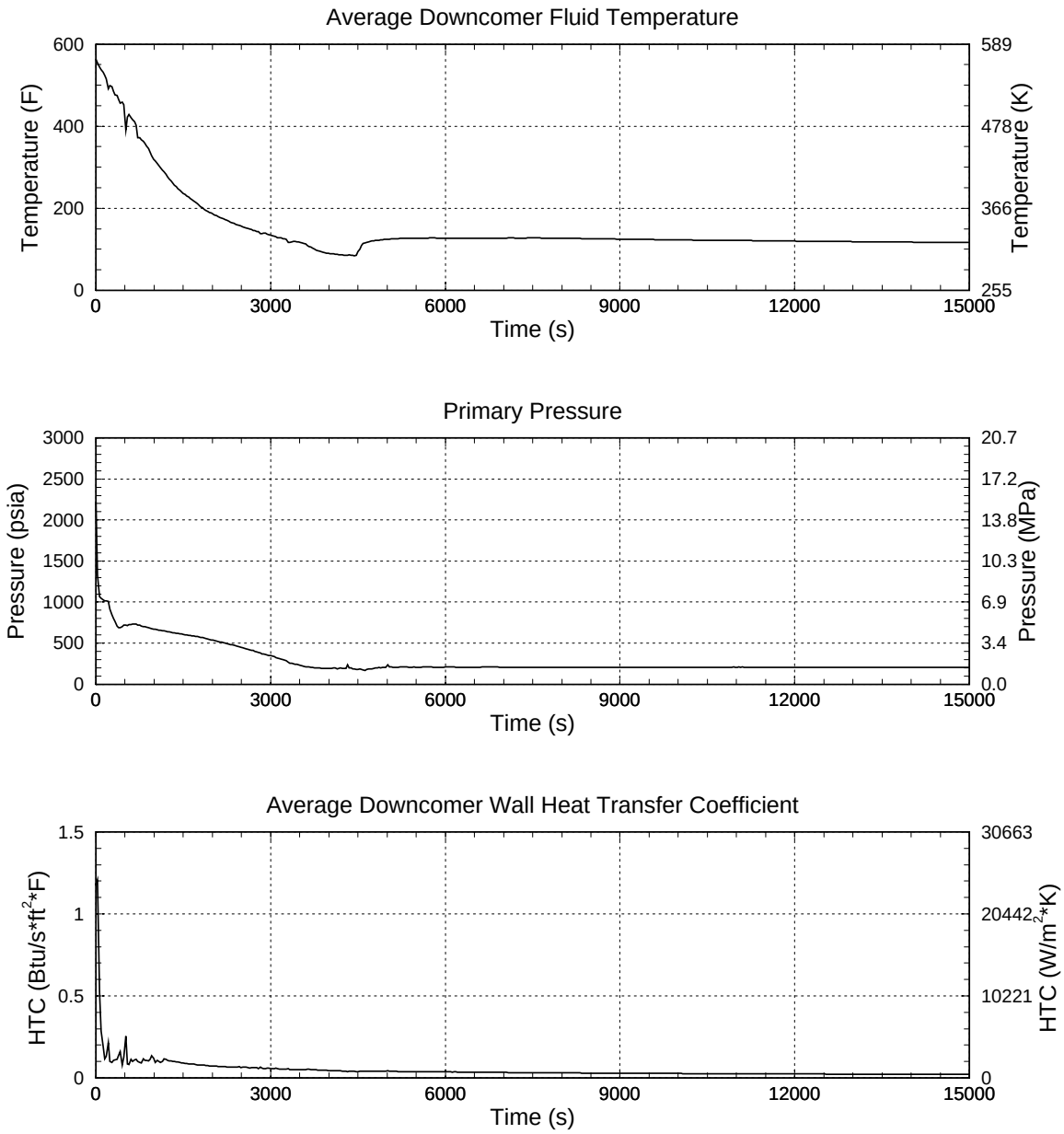


Figure A.2-159: Oconee PTS Results for Case 154

Case Category	LOCA-HiK
Primary Failures	28.738 cm (11.314 in) hot leg break. ECC suction switch to the containment sump included in the analysis.
Secondary Failures	None
Operator Actions	None
Min DC Temp	297.0 K (74.8°F) at 1770 s
Comments	None.

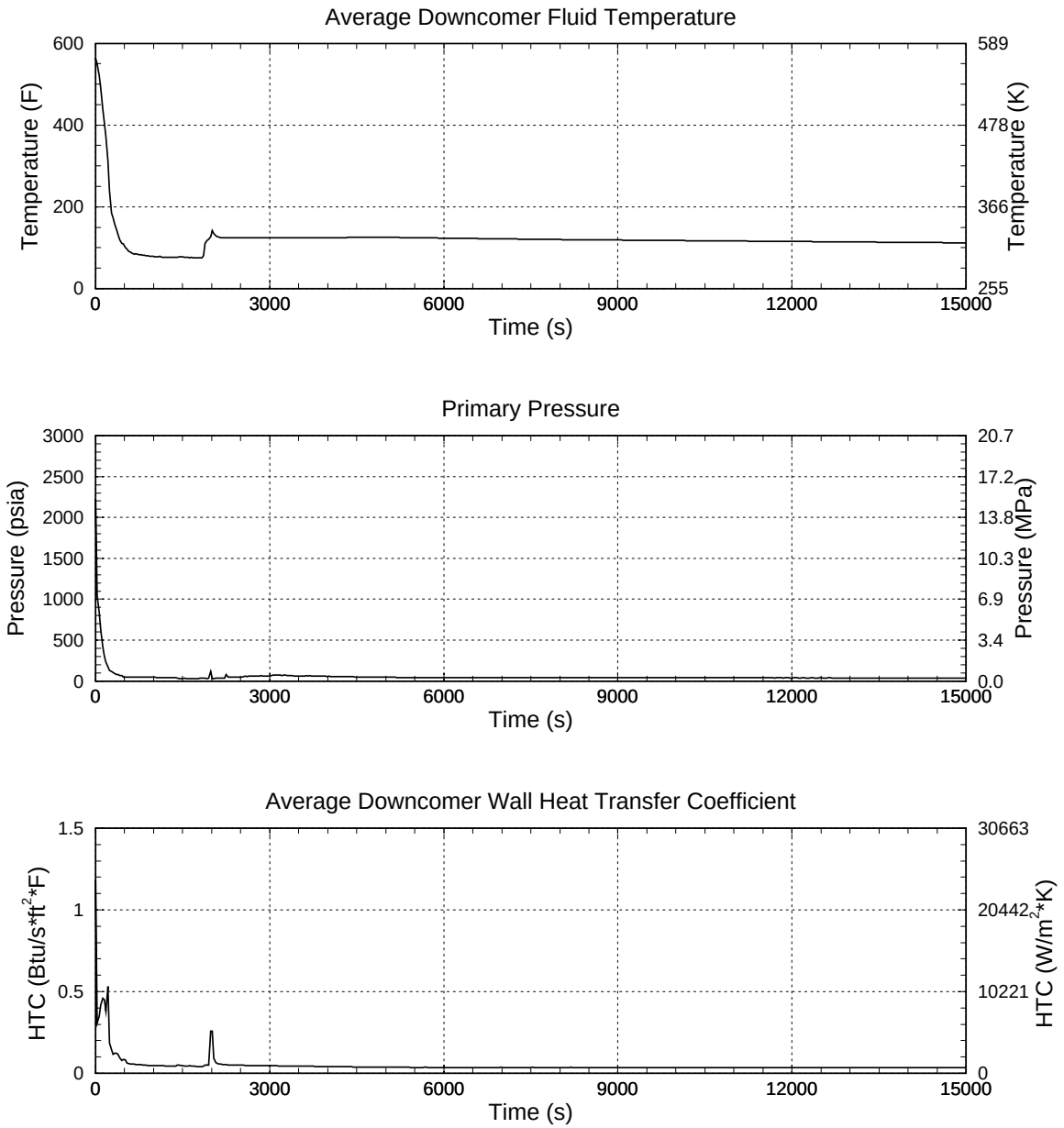


Figure A.2-160: Oconee PTS Results for Case 155

Case Category	LOCA-HiK
Primary Failures	40.64 cm (16 in) hot leg break. ECC suction switch to the containment sump included in the analysis.
Secondary Failures	None
Operator Actions	None
Min DC Temp	297.4 K (75.7°F) at 1560 s
Comments	None.

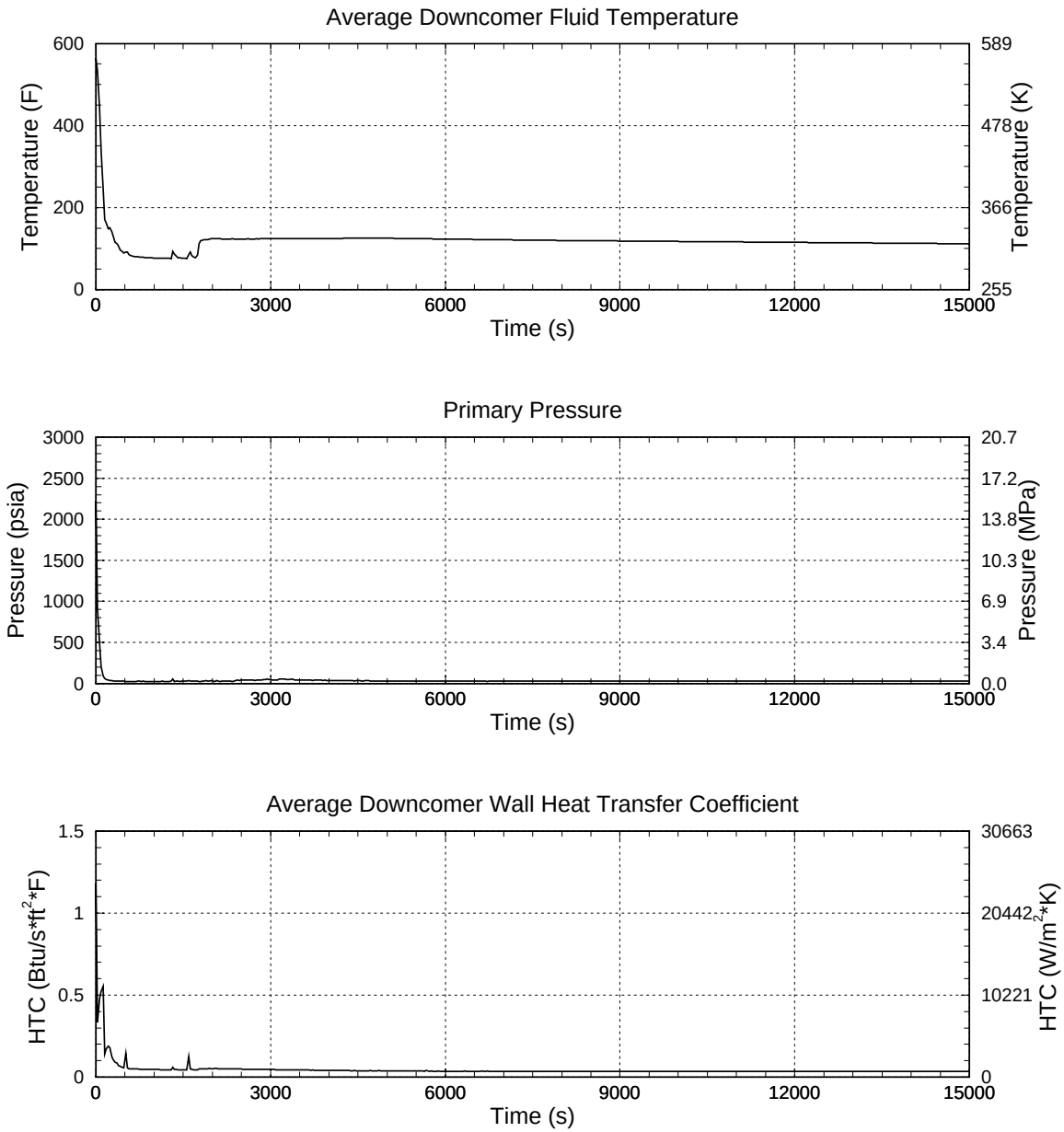


Figure A.2-161: Oconee PTS Results for Case 156

Case Category	LOCA-HiK
Primary Failures	57.48 cm (22.63 in) hot leg break. ECC suction switch to the containment sump included in the analysis.
Secondary Failures	None
Operator Actions	None
Min DC Temp	297.2 K (75.3°F) at 1470 s
Comments	None.

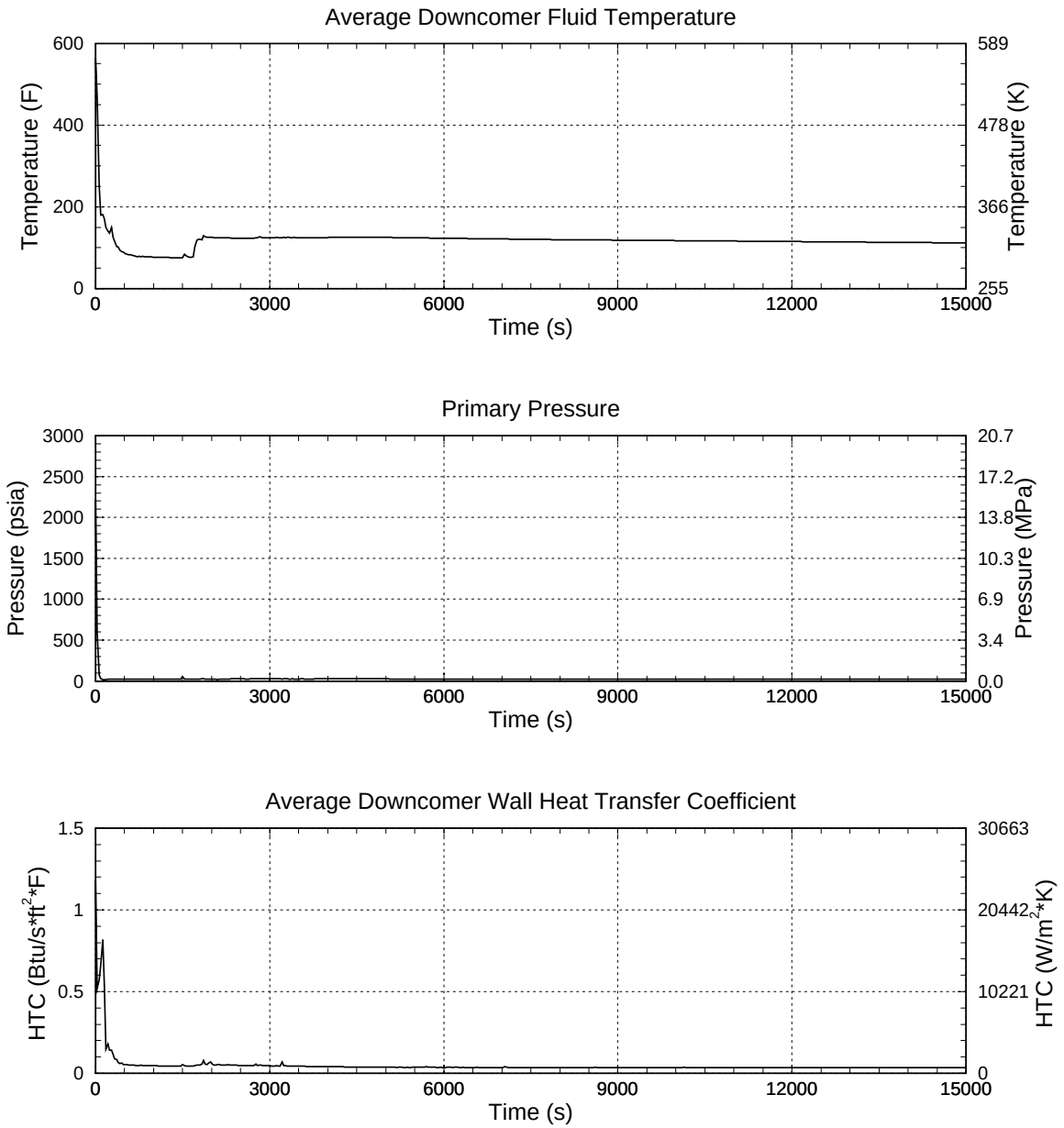


Figure A.2-162: Oconee PTS Results for Case 157

Case Category	LOCA-HiK
Primary Failures	40.64 cm (16 in) cold leg break. ECC suction switch to the containment sump included in the analysis.
Secondary Failures	None
Operator Actions	None
Min DC Temp	297.6 K (76.0°F) at 1290 s
Comments	None.

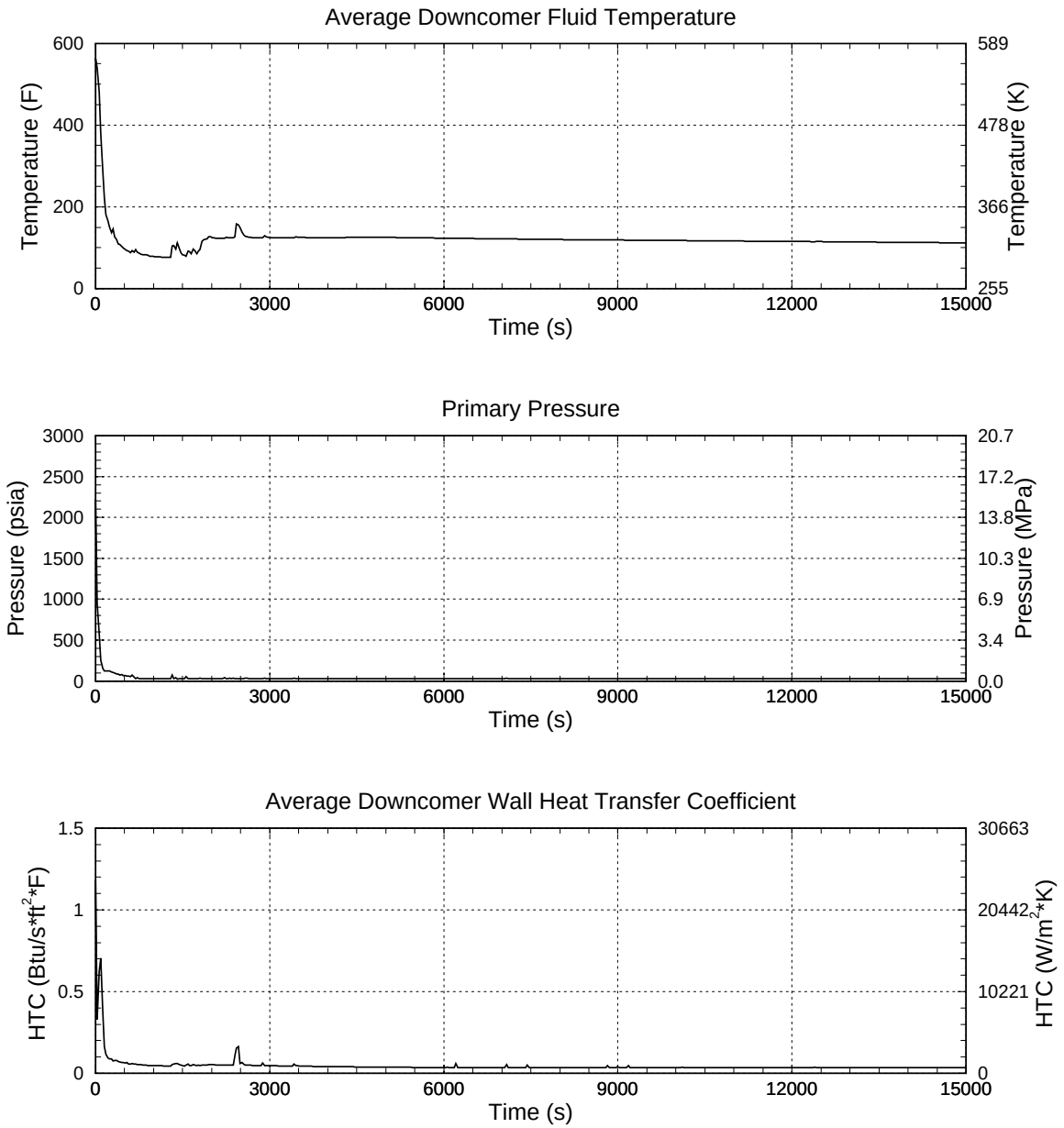


Figure A.2-163: Oconee PTS Results for Case 158

Case Category	LOCA-HiK
Primary Failures	14.37 cm (5.656 in) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	294.4 K (70.2°F) at 12090 s
Comments	None.

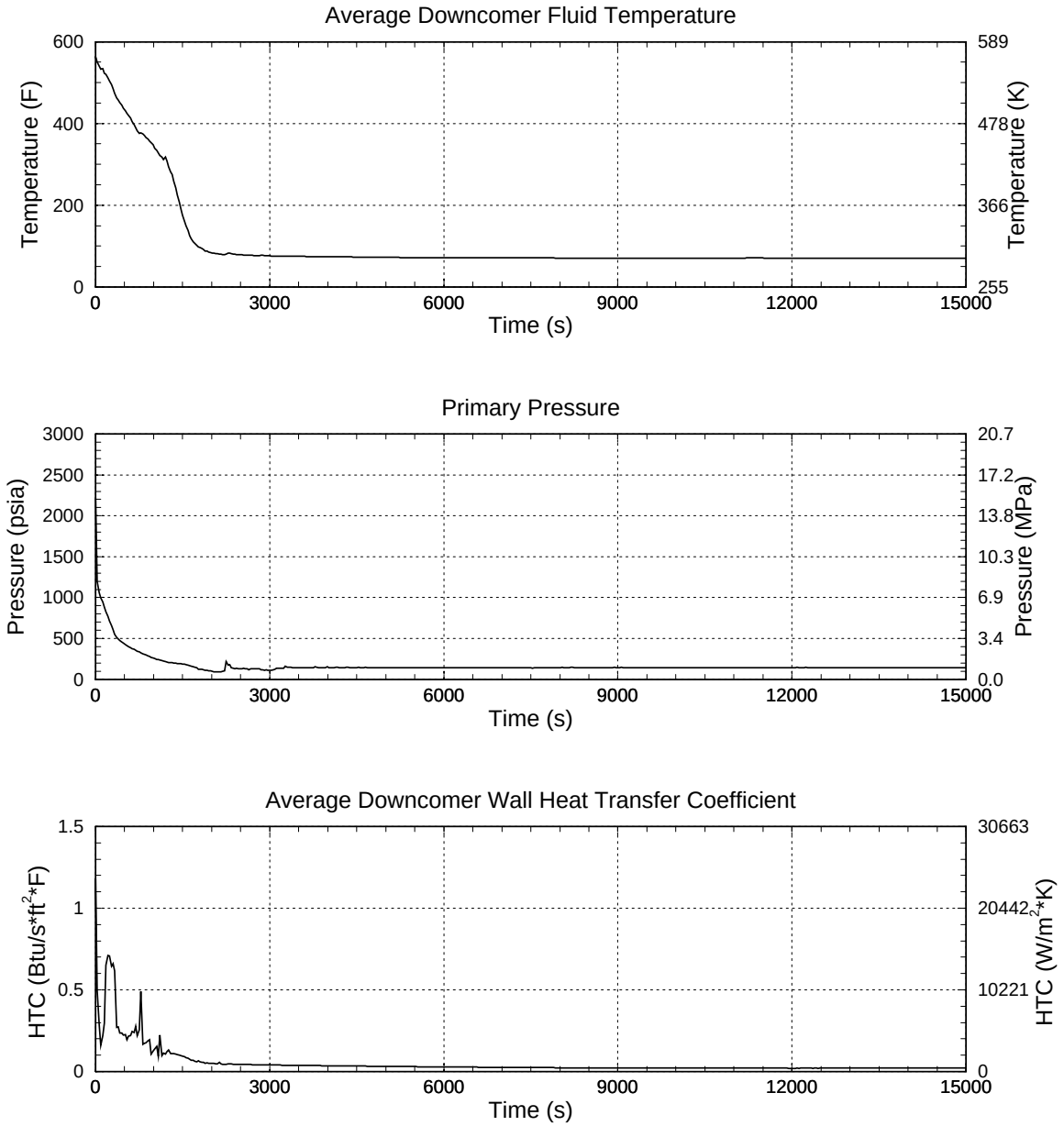


Figure A.2-164: Oconee PTS Results for Case 159

Case Category	LOCA-HiK
Primary Failures	14.37 cm (5.656 in) surge line break. ECC suction switch to the containment sump included in the analysis.
Secondary Failures	None
Operator Actions	None
Min DC Temp	298.1 K (76.9°F) at 2790 s
Comments	None.

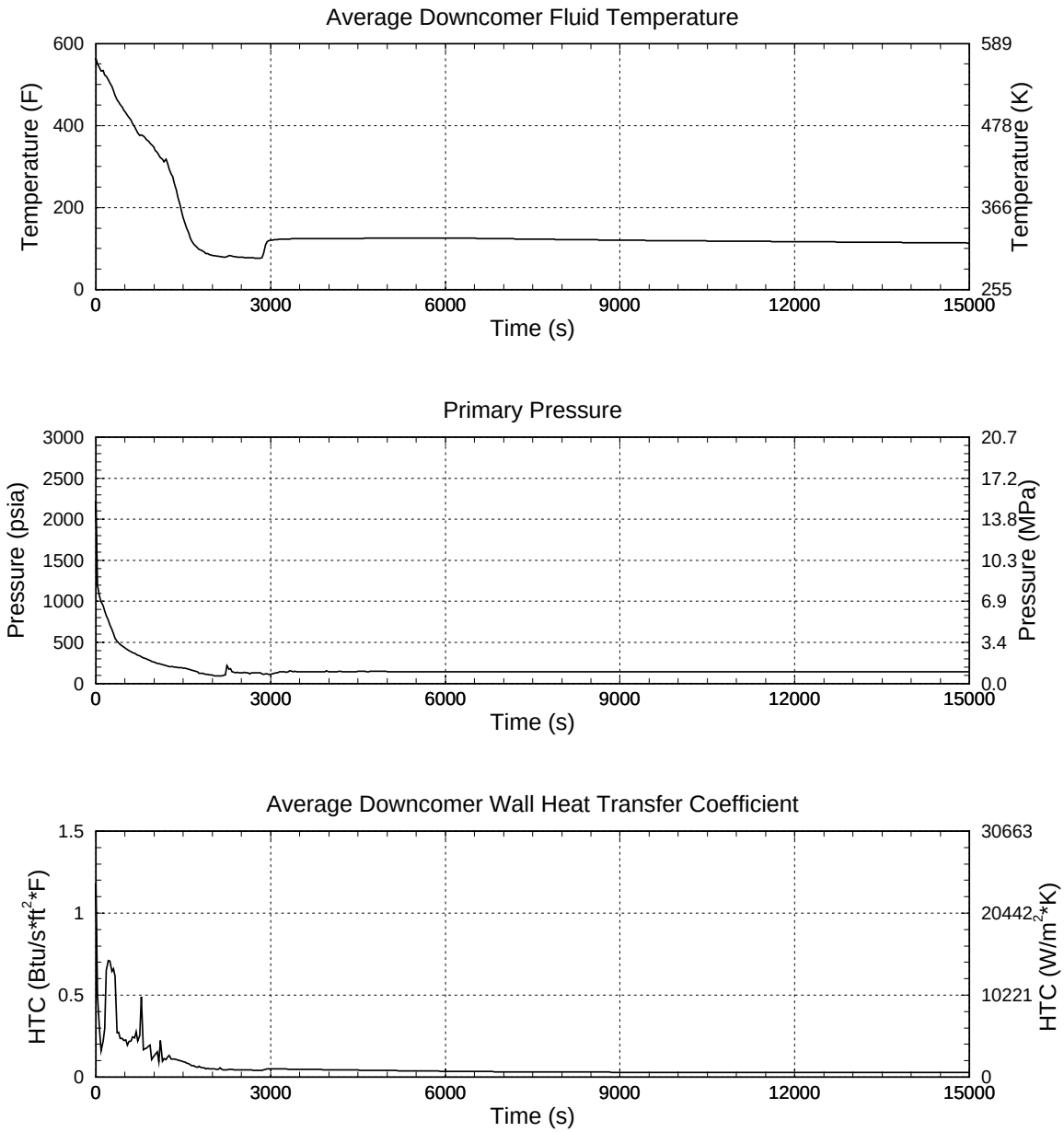


Figure A.2-165: Oconee PTS Results for Case 160

Case Category	LOCA-HiK, HZP
Primary Failures	14.366 cm (5.656 in) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	294.3 K (70.0°F) at 15000 s
Comments	None.

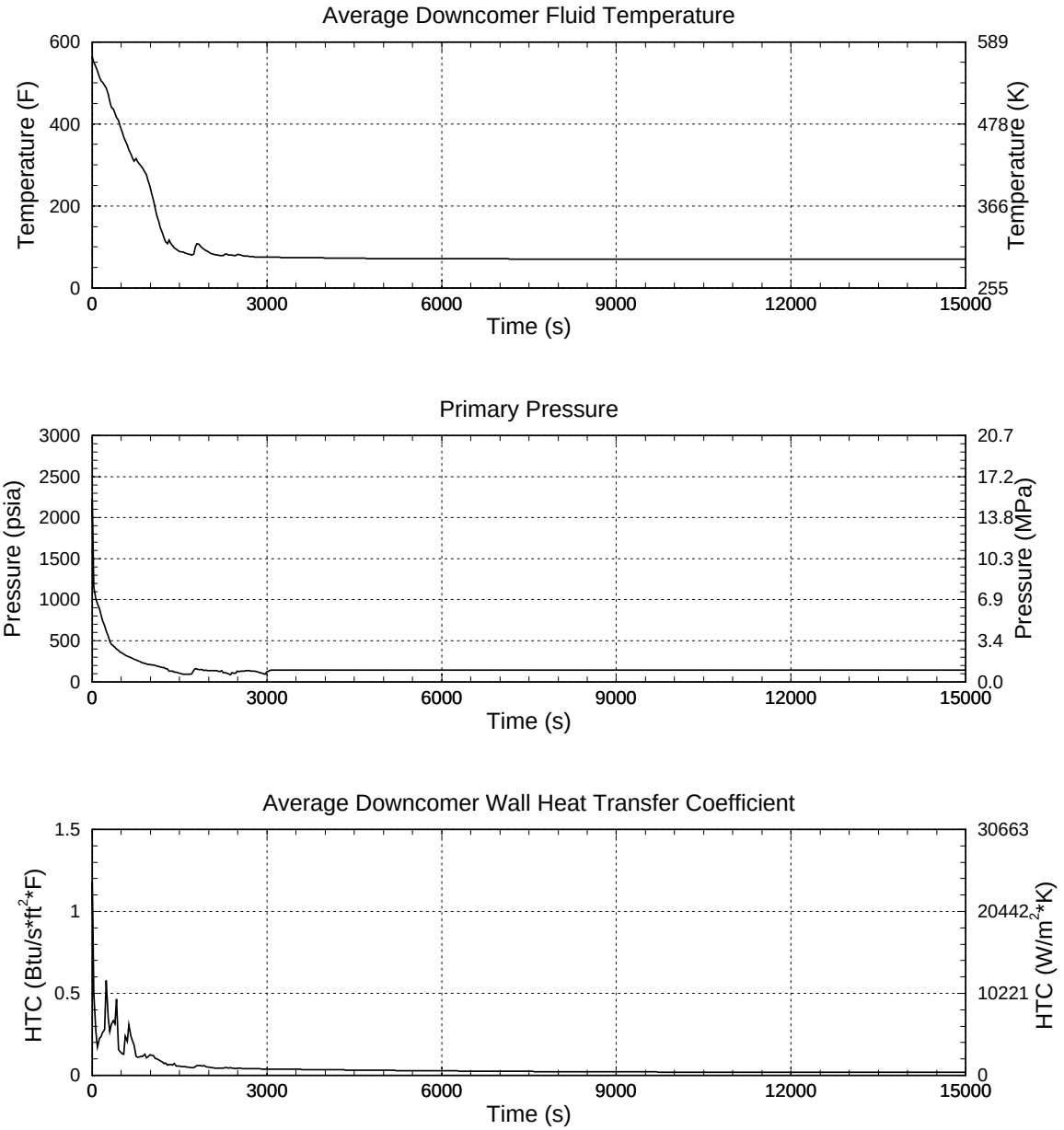


Figure A.2-166: Oconee PTS Results for Case 161

Case Category	LOCA-HiK, HZP
Primary Failures	14.366 cm (5.656 in) surge line break. ECC suction switch to the containment sump included in the analysis.
Secondary Failures	None
Operator Actions	None
Min DC Temp	298.0 K (76.7°F) at 2640 s
Comments	None.

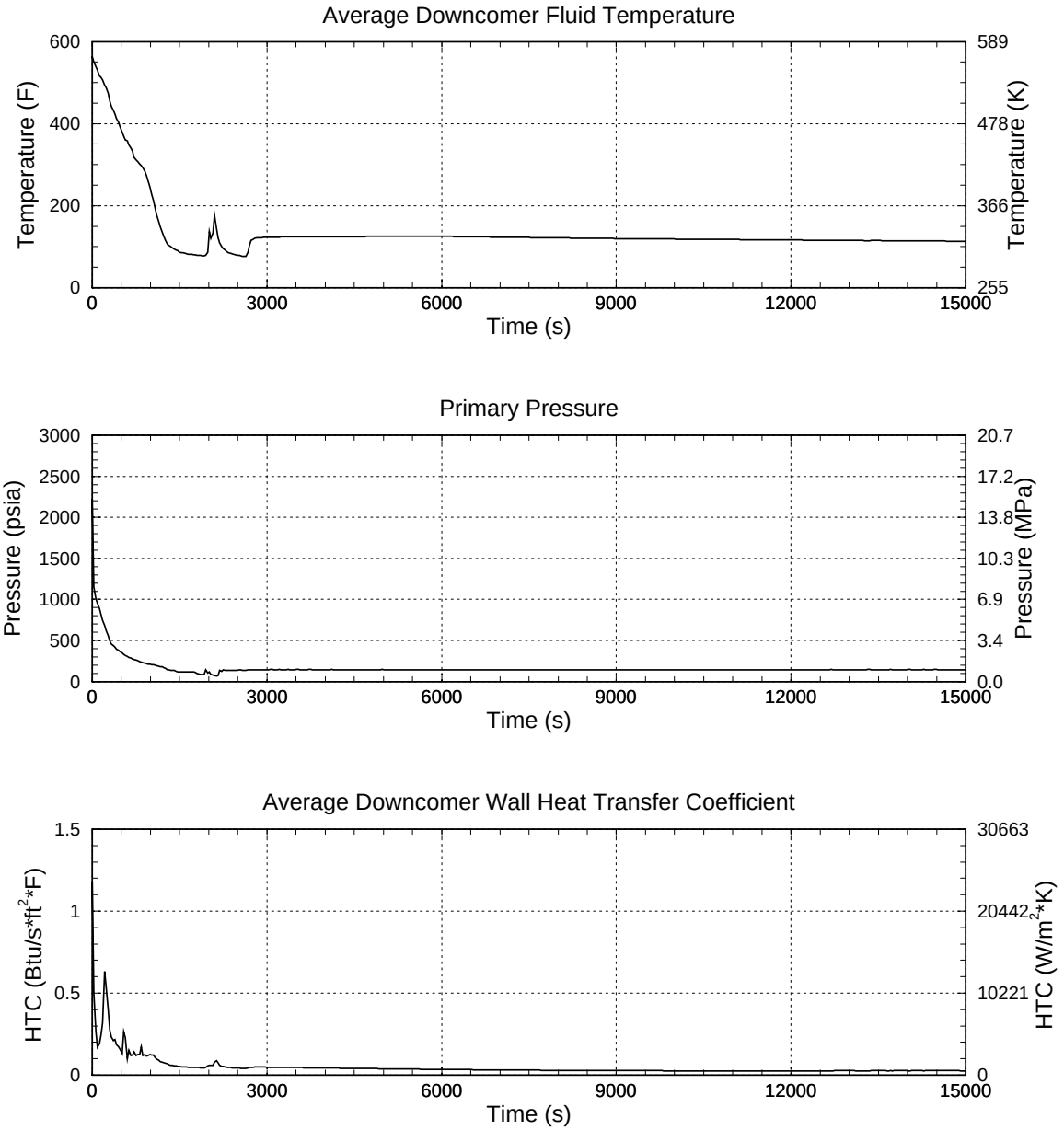


Figure A.2-167: Oconee PTS Results for Case 162

Case Category	LOCA-HiK
Primary Failures	20.32 cm (8 inch) surge line break
Secondary Failures	None
Operator Actions	None
Min DC Temp	294.2 K (70.0°F) at 15000 s
Comments	None.

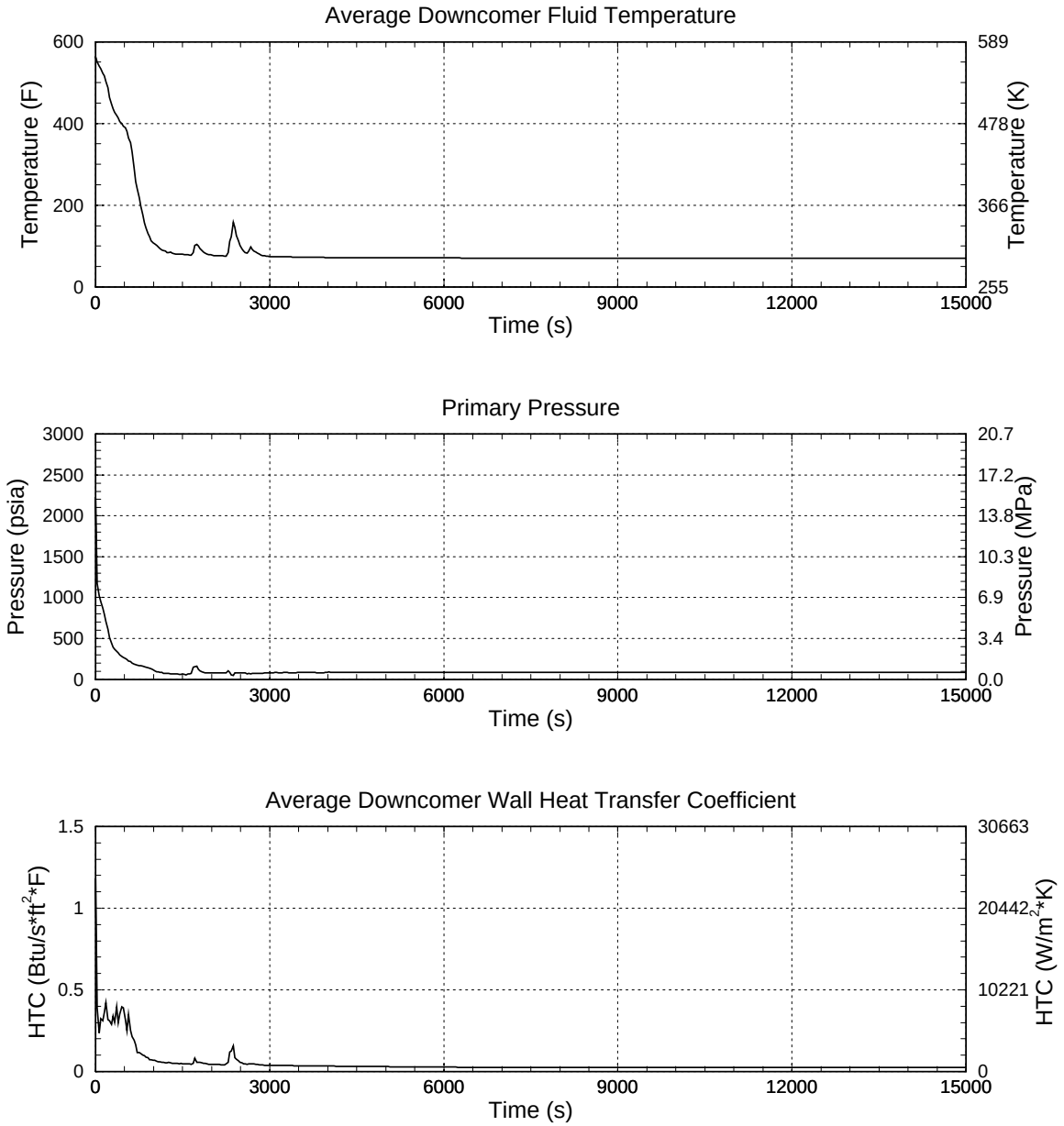


Figure A.2-168: Oconee PTS Results for Case 163

Case Category	LOCA-HiK
Primary Failures	20.32 cm (8 inch) surge line break. ECC suction switch to the containment sump included in the analysis.
Secondary Failures	None
Operator Actions	None
Min DC Temp	297.4 K (75.6°F) at 2250 s
Comments	None.

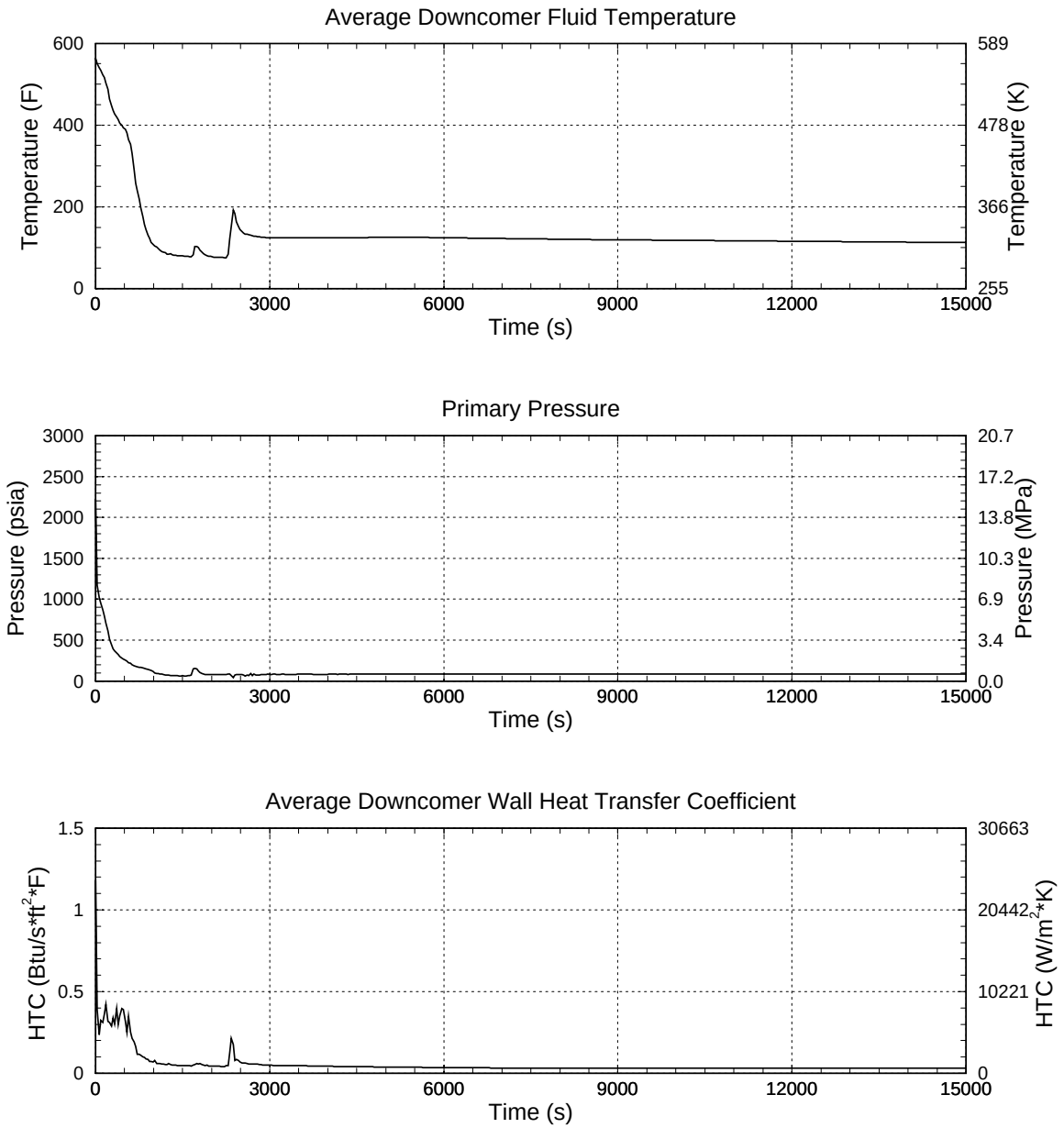


Figure A.2-169: Oconee PTS Results for Case 164

Case Category	TT/RT-Hi K, HZP
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 6000 secs (RCS low pressure point).
Secondary Failures	None
Operator Actions	None
Min DC Temp	305.9 K (91.0°F) at 6300 s
Comments	None.

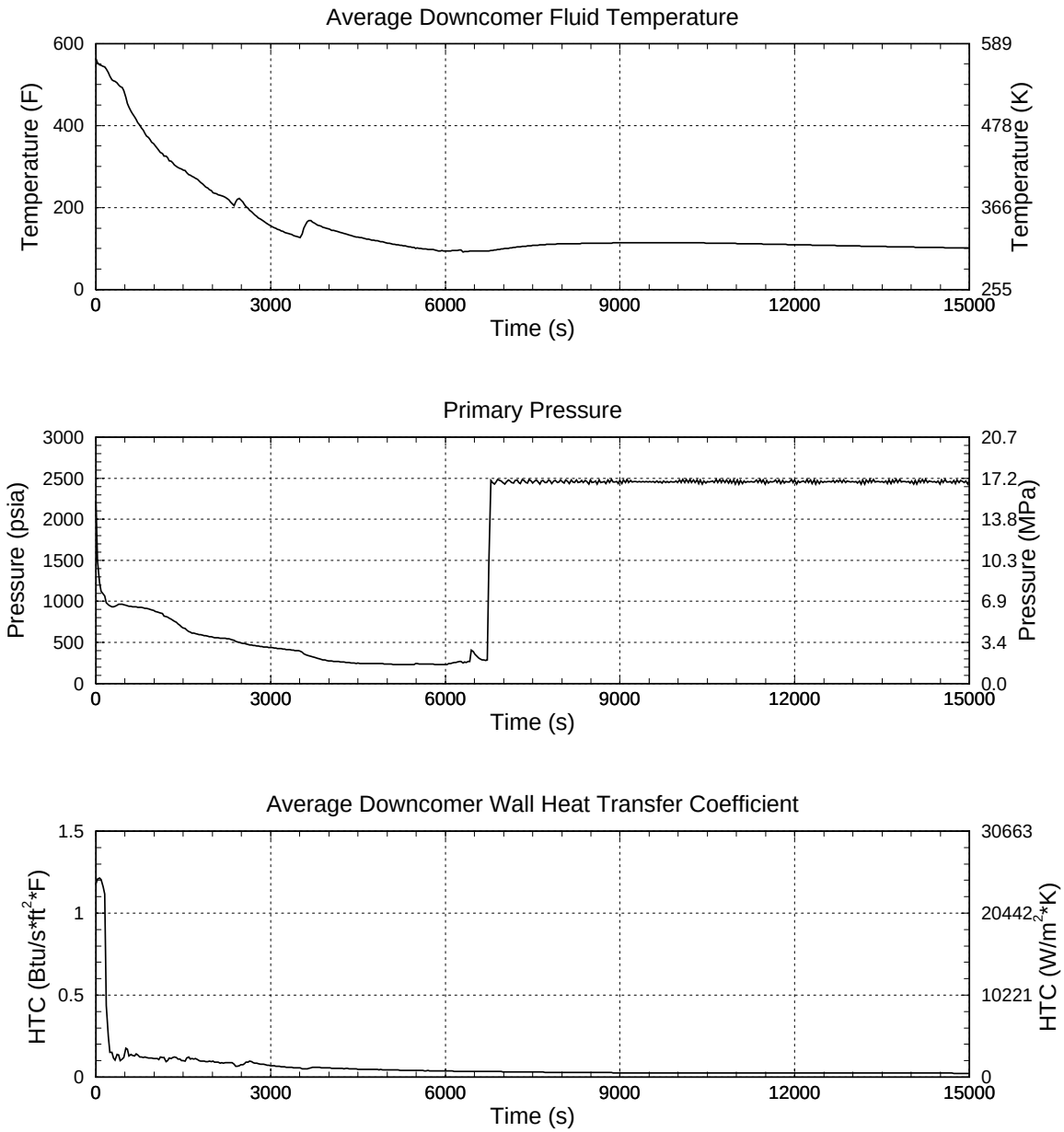


Figure A.2-170: Oconee PTS Results for Case 165

Case Category	TT/RT-Hi K, HZP
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 6000 secs.
Secondary Failures	None
Operator Actions	After valve recloses, operator throttles HPI 1 minute after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 50°F subcooling)
Min DC Temp	308.1 K (94.9°F) at 6450 s
Comments	None.

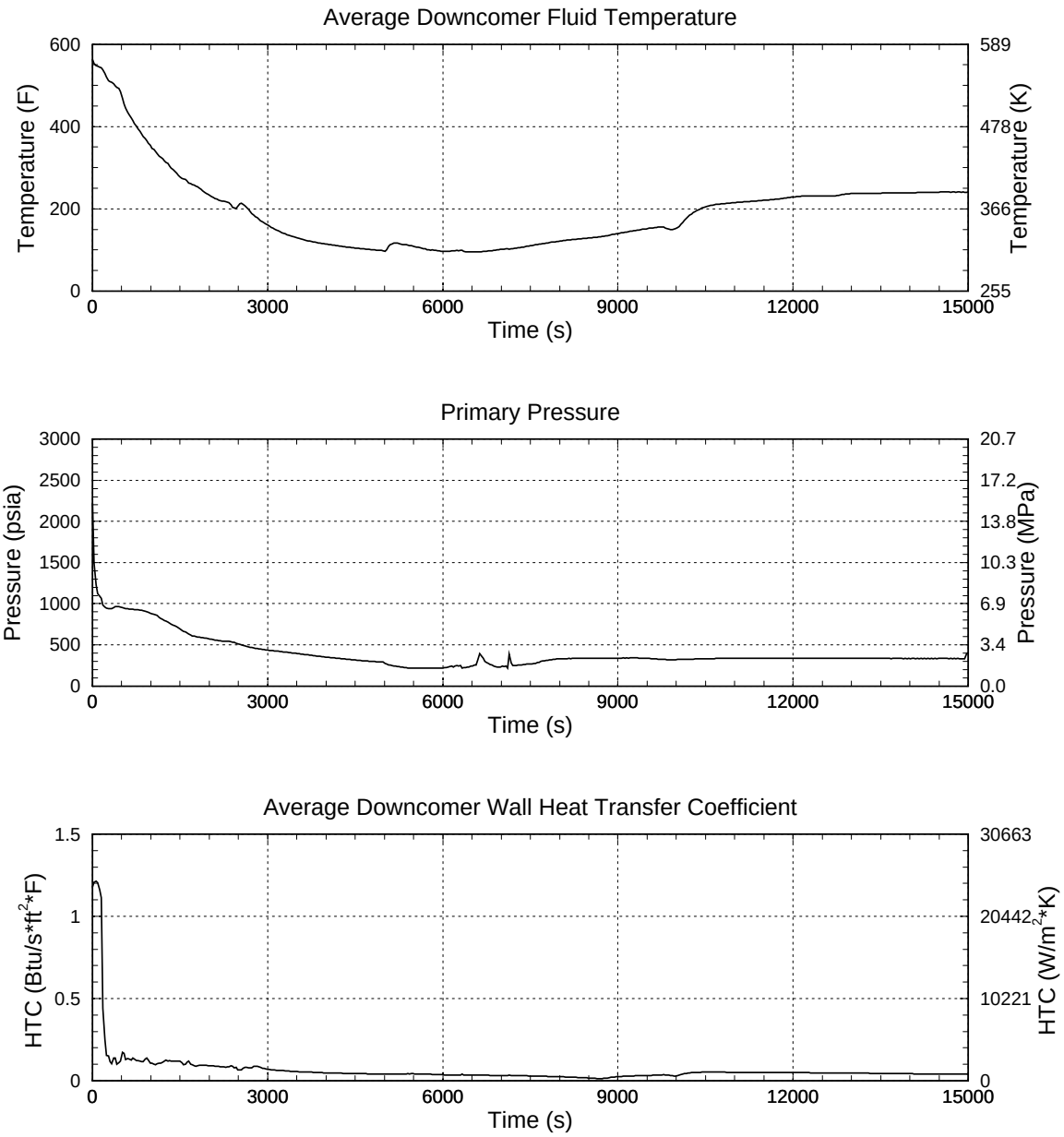


Figure A.2-171: Oconee PTS Results for Case 166

Case Category	TT/RT-Hi K, HZP
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 6000 secs.
Secondary Failures	None
Operator Actions	After valve recloses, operator throttles HPI 10 minutes after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 50°F subcooling)
Min DC Temp	308.1 K (94.9°F) at 6450 s
Comments	None.

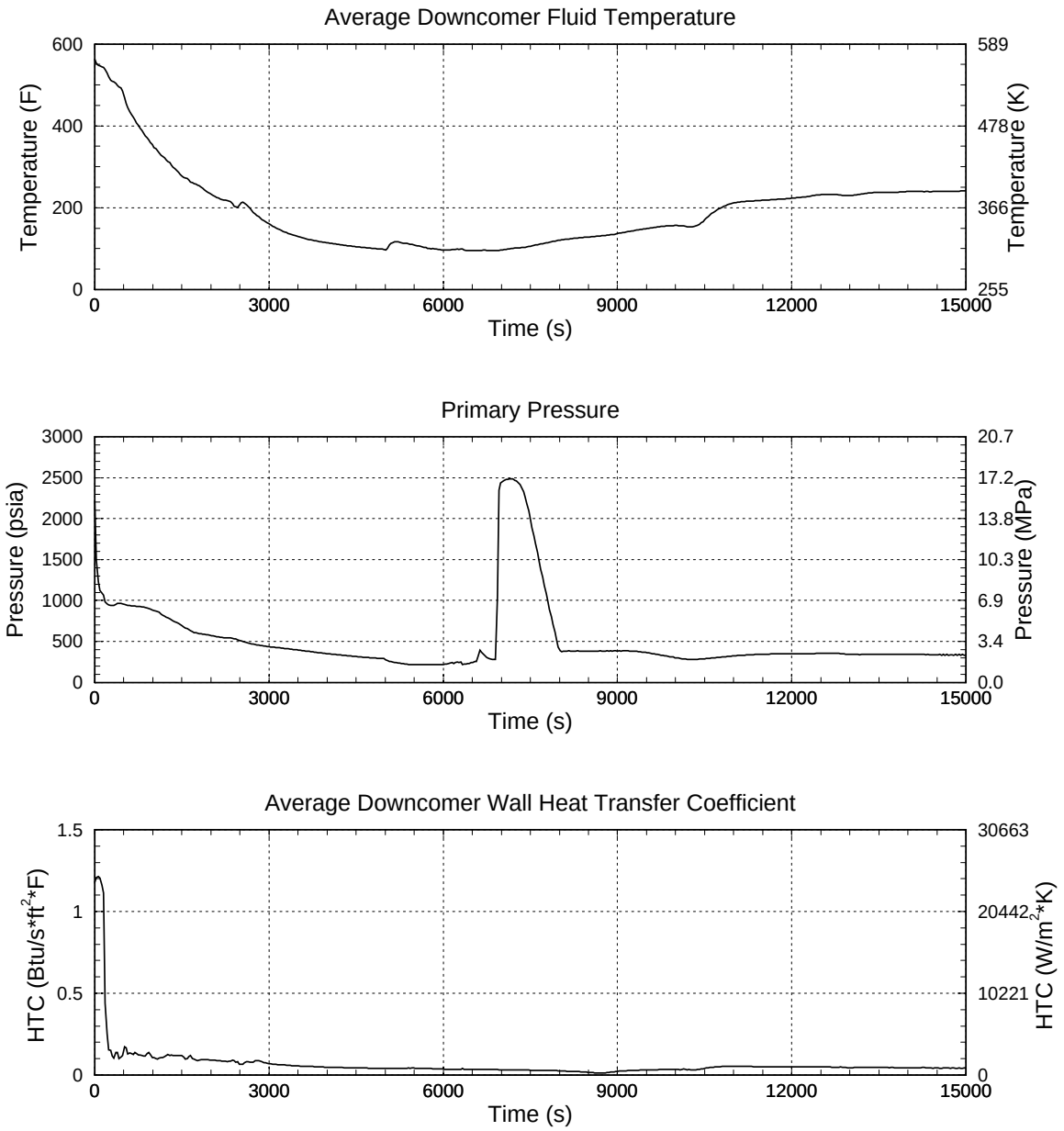


Figure A.2-172: Oconee PTS Results for Case 167

Case Category	TT/RT-Hi K, HZP
Primary Failures	TT/RT with stuck open pzr SRV. SRV assumed to reclose at 3000 secs. Operator does not throttle HPI.
Secondary Failures	None
Operator Actions	None
Min DC Temp	317.5 K (111.9°F) at 15000 s
Comments	None.

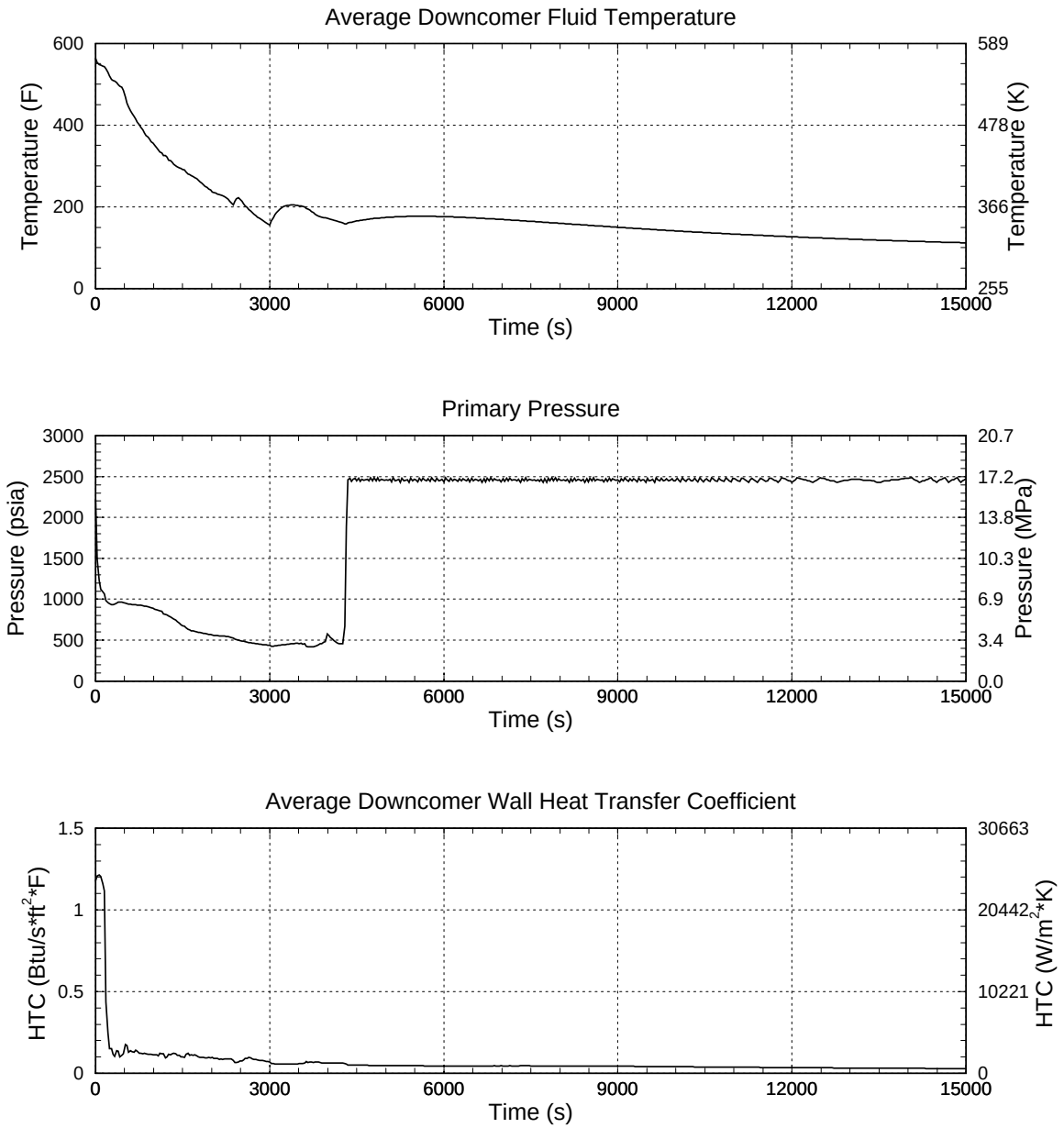


Figure A.2-173: Oconee PTS Results for Case 168

Case Category	LOCA-HiK, HZP
Primary Failures	TT/RT with stuck open pzr SRV (valve flow area reduced by 30 percent). Summer conditions assumed (HPI, LPI temp = 302 K (85°F) and CFT temp = 310 K (100°F)). Vent valves do not function.
Secondary Failures	None
Operator Actions	None
Min DC Temp	305.0 K (89.4°F) at 15000 s
Comments	None.

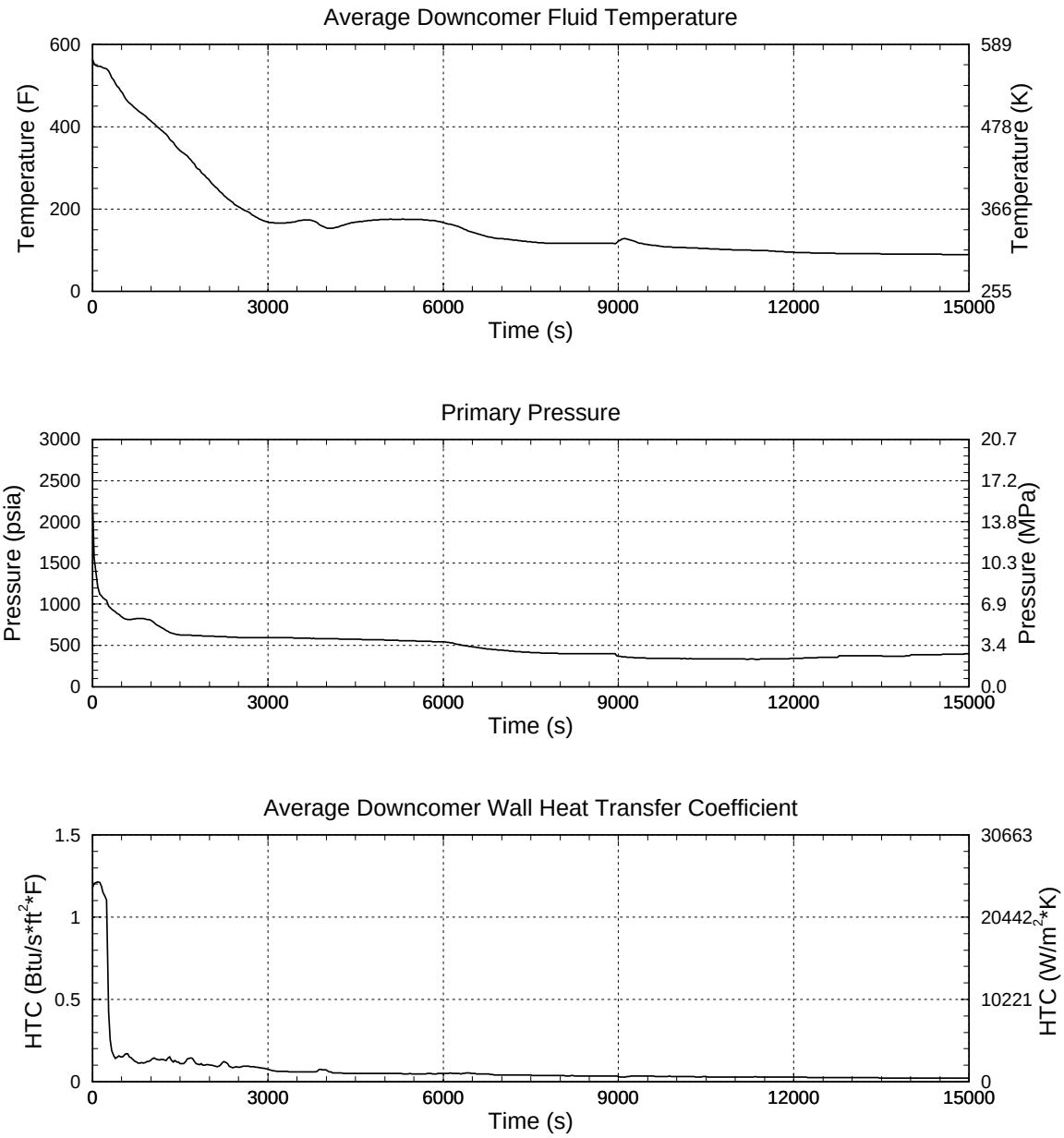


Figure A.2-174: Oconee PTS Results for Case 169

Case Category	TT/RT-Hi K, HZP
Primary Failures	TT/RT with stuck open pzr SRV. Summer conditions assumed (HPI, LPI temp = 302 K (85°F) and CFT temp = 310 K (100°F)).
Secondary Failures	None
Operator Actions	None
Min DC Temp	304.2 K (87.8°F) at 14670 s
Comments	None.

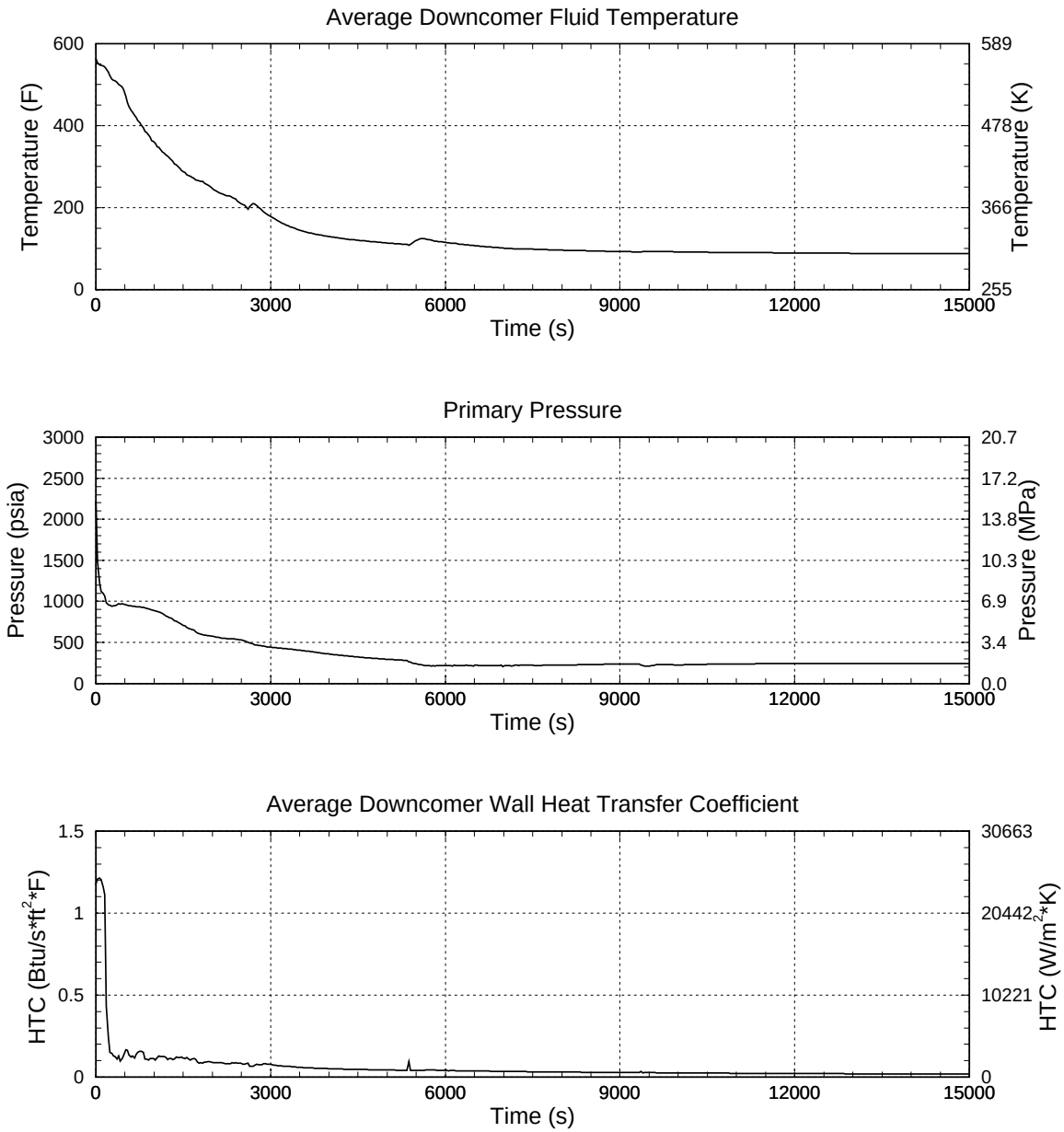


Figure A.2-175: Oconee PTS Results for Case 170

Case Category	TT/RT-Hi K, HZP
Primary Failures	TT/RT with partially stuck open pzr SRV (flow area equivalent to 1.5 in diameter opening). HTC coefficients increased by 1.3.
Secondary Failures	None
Operator Actions	None
Min DC Temp	420.2 K (296.7°F) at 15000 s
Comments	None.

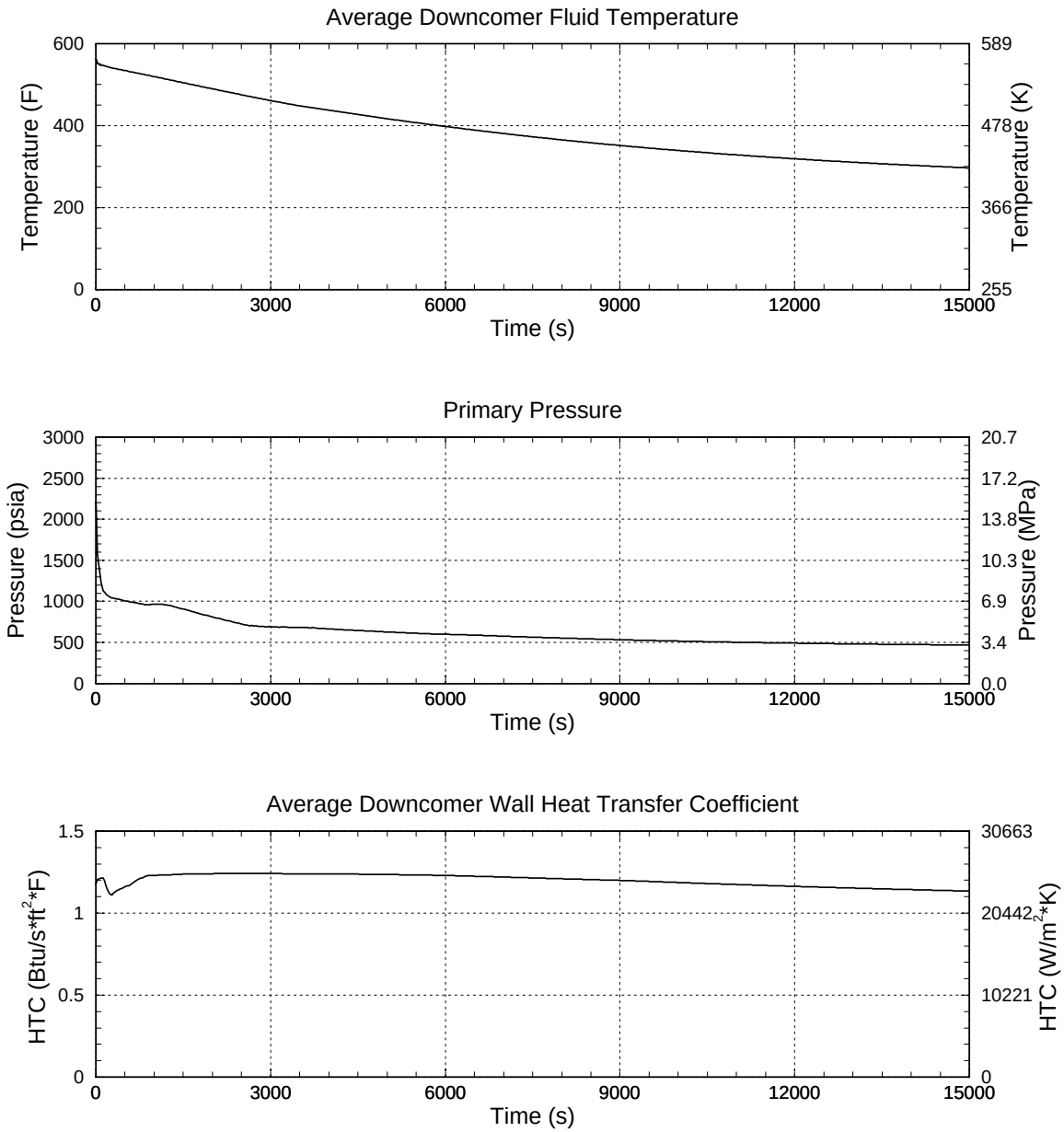


Figure A.2-176: Oconee PTS Results for Case 171

Case Category	LOCA-HiK
Primary Failures	10.16 cm (4 in) cold leg break. ECC suction switch to the containment sump included in the analysis.
Secondary Failures	None
Operator Actions	None
Min DC Temp	301.1 K (82.3°F) at 3690 s
Comments	None.

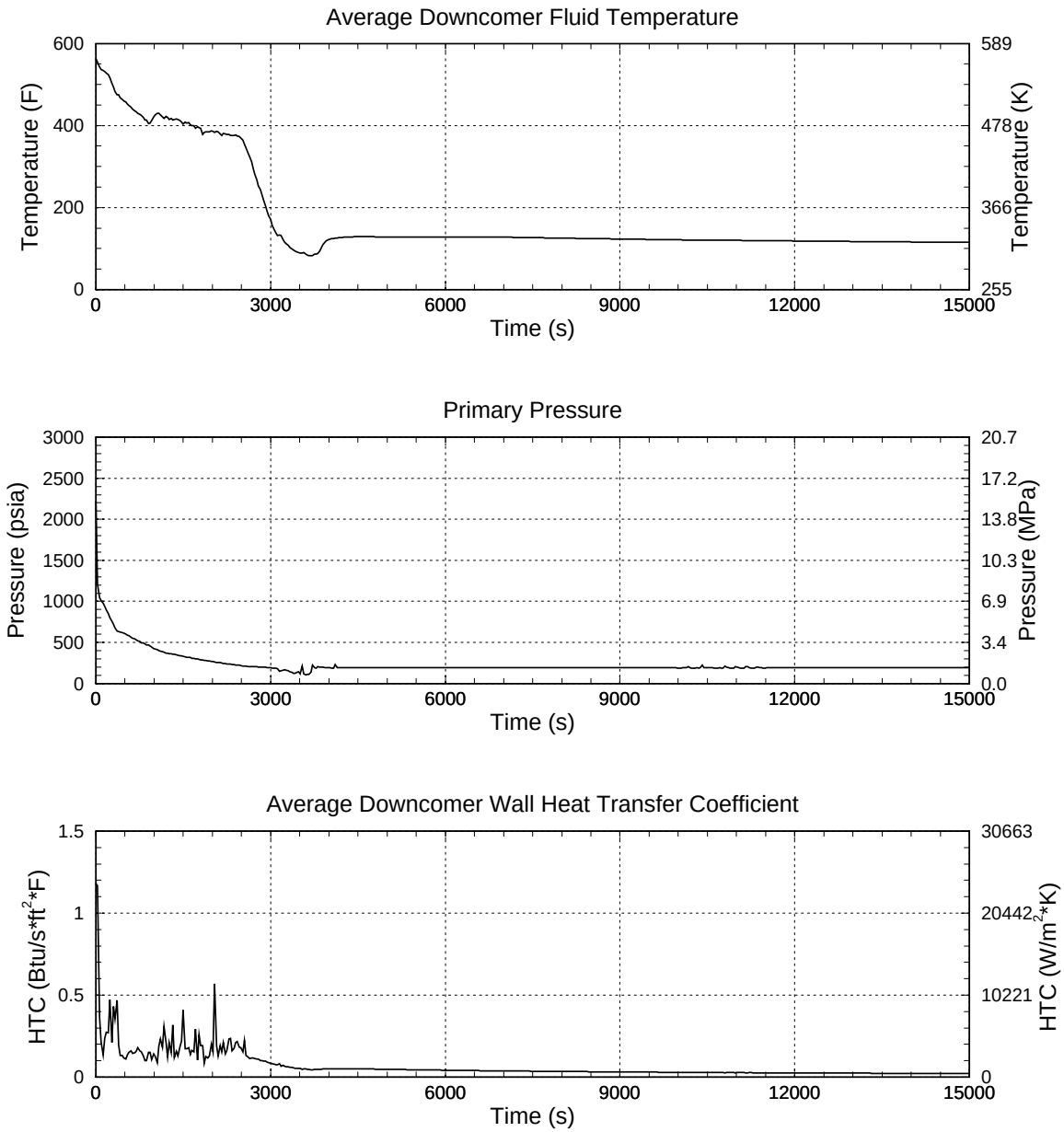
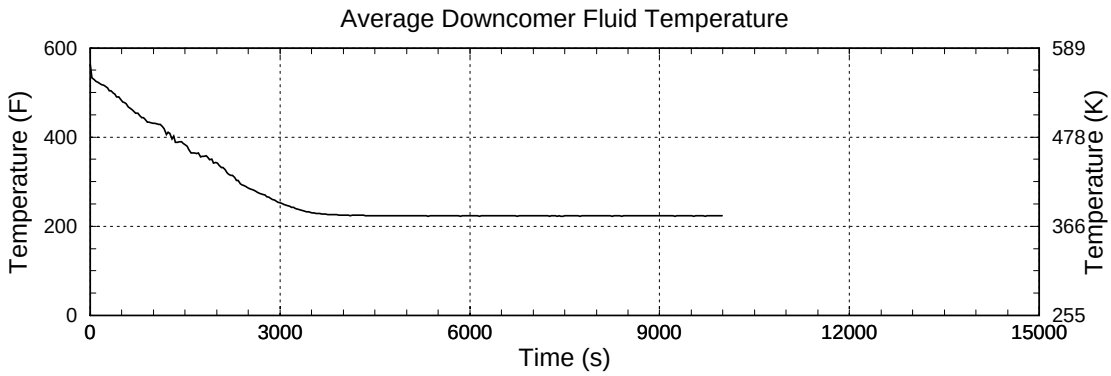
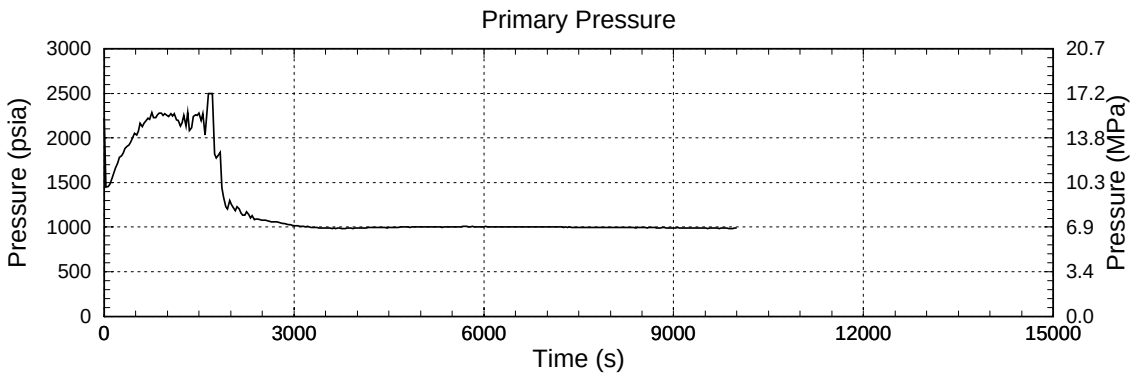


Figure A.2-177: Oconee PTS Results for Case 172

Case Category	MSLB-HZP
Primary Failures	No primary side failure. Decay power set to 0.007 of full power and held constant (17.98 MW).
Secondary Failures	MSLB with trip of turbine driven EFW by MSLB Circuitry
Operator Actions	Operator throttles HPI 20 minutes after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	379.0 K (222.5°F) at 7740 s
Comments	None.





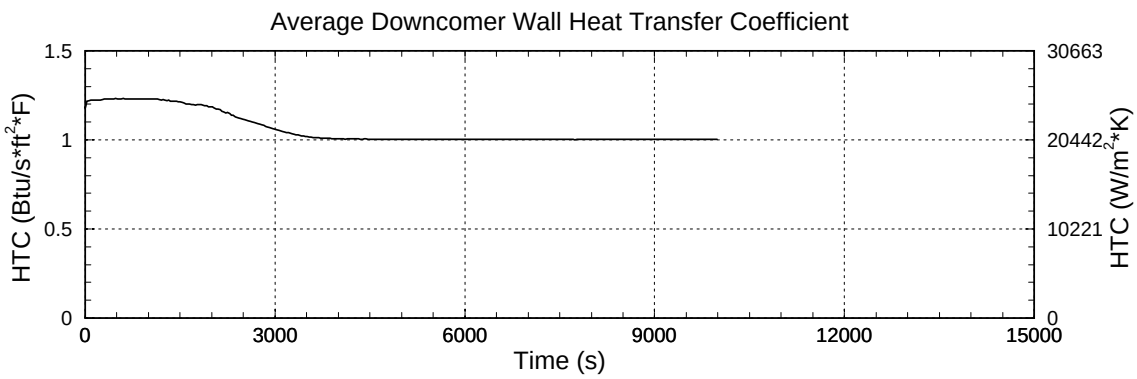


Figure A.2-178: Oconee PTS Results for Case 173

Case Category	MSLB-HZP
Primary Failures	No primary side failure. Decay power set to 0.003 of full power and held constant (7.70 MW).
Secondary Failures	MSLB with trip of turbine driven EFW by MSLB Circuitry
Operator Actions	Operator throttles HPI 20 minutes after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	378.0 K (220.8°F) at 8040 s
Comments	None.

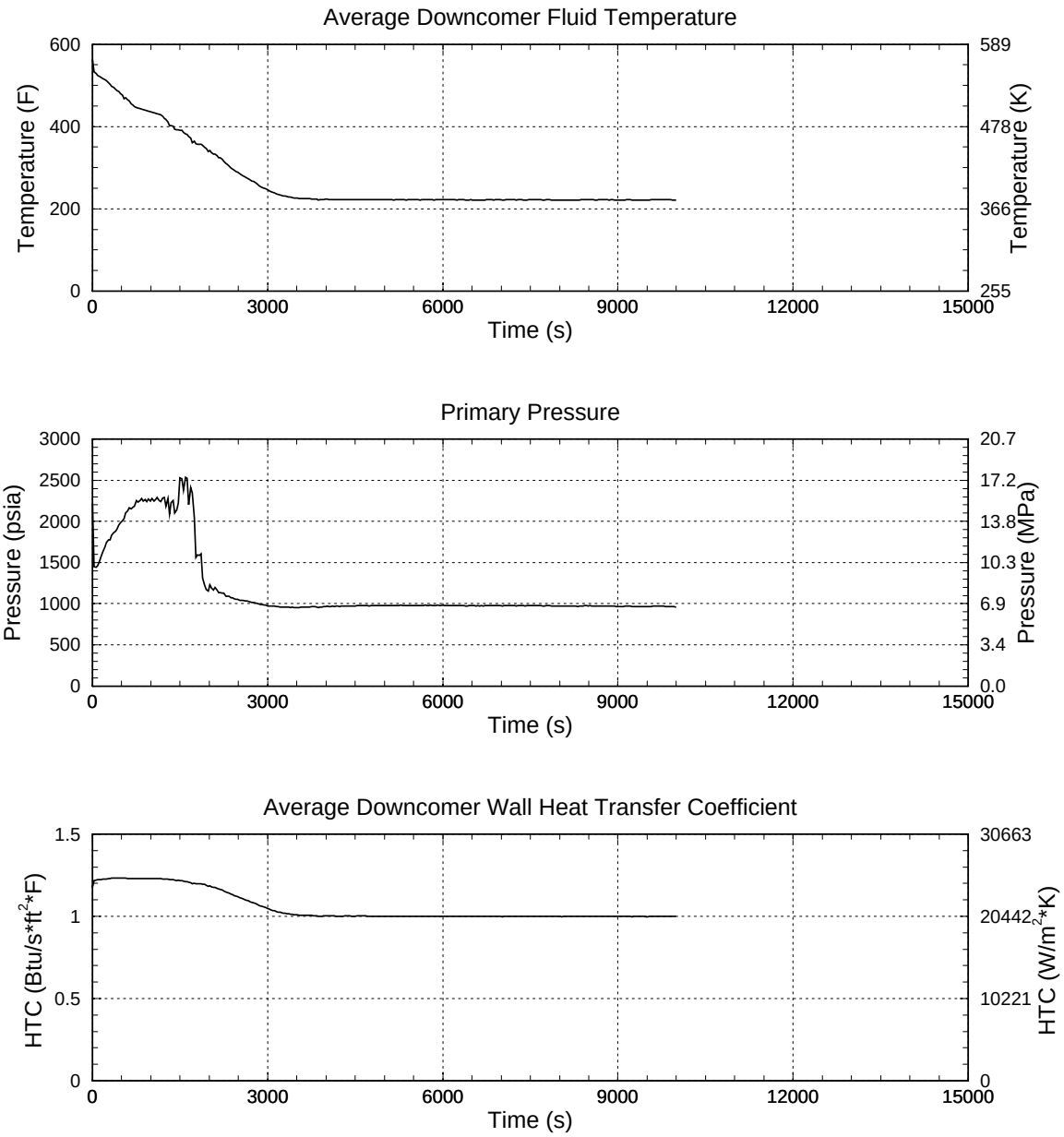


Figure A.2-179: Oconee PTS Results for Case 174

Case Category	TT/RT-Hi K, HZP
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 6000 secs. Decay power set to 0.007 of full power and held constant (17.98 MW).
Secondary Failures	None
Operator Actions	Operator throttles HPI at 10 minutes after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	306.4 K (91.8°F) at 6030 s
Comments	None.

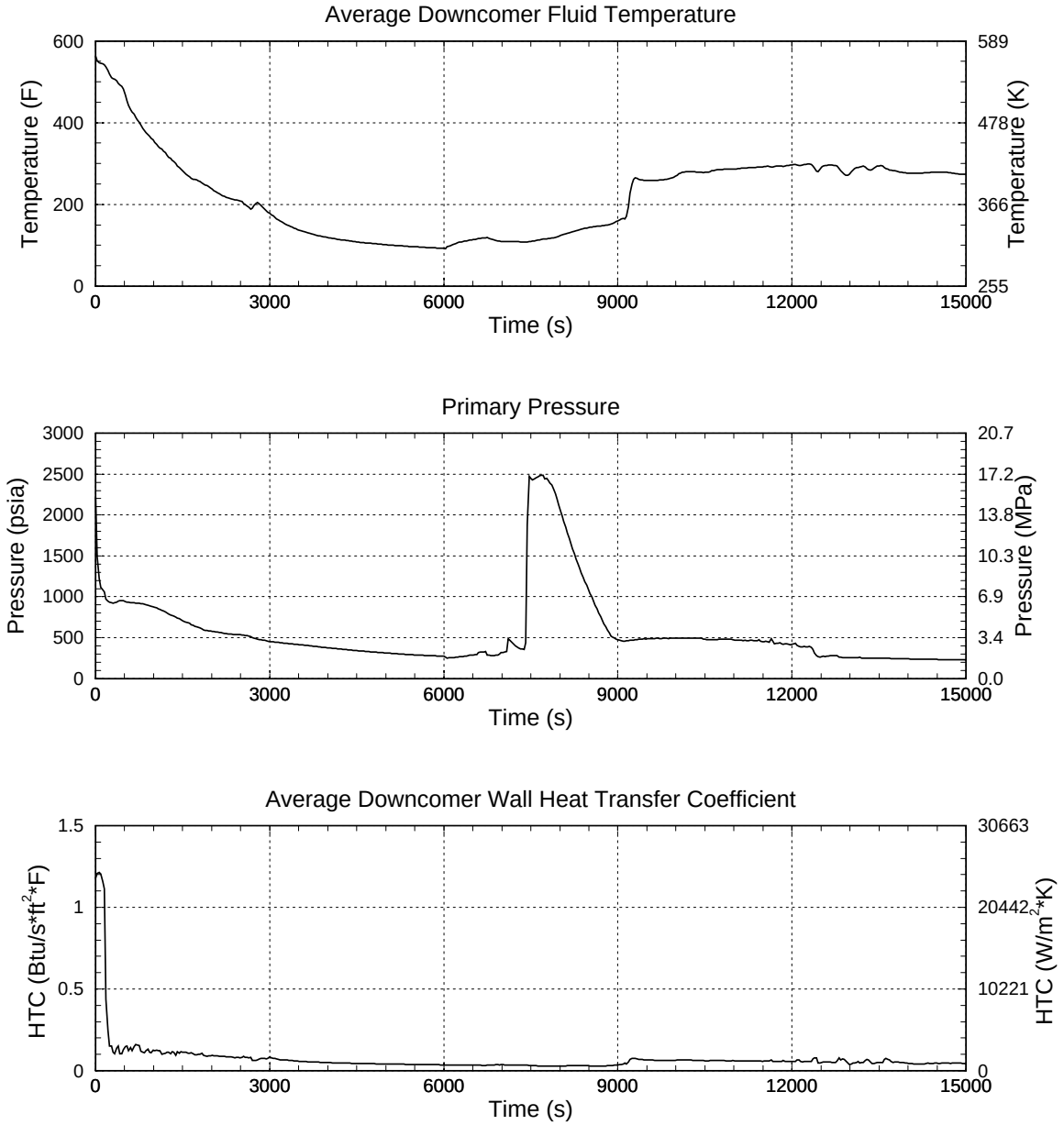


Figure A.2-180: Oconee PTS Results for Case 175

Case Category	TT/RT-Hi K, HZP
Primary Failures	Stuck open pressurizer safety valve. Valve recloses at 6000 secs. Decay power set to 0.003 of full power and held constant (7.70 MW).
Secondary Failures	None
Operator Actions	Operator throttles HPI at 10 minutes after 2.7 K (5°F) subcooling and 254 cm (100 in) pressurizer level is reached (throttling criteria is 27.8 K (50°F) subcooling).
Min DC Temp	305.6 K (90.5°F) at 6330 s
Comments	None.

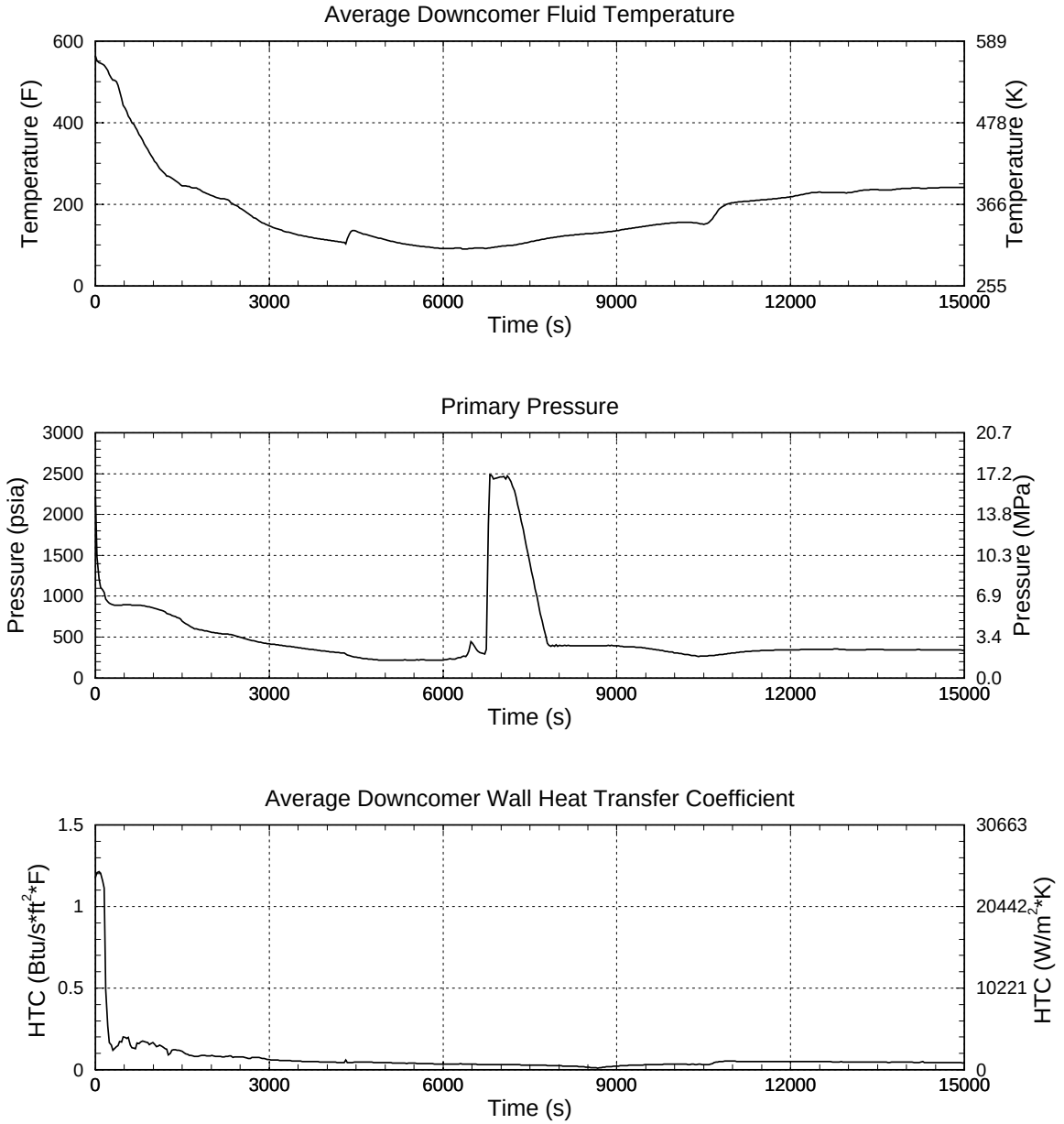


Figure A.2-181: Oconee PTS Results for Case 176

Case Category	LOCA-HiK
Primary Failures	10.16 cm (4 in) surge line break. ECC suction switch to the containment sump included in the analysis.
Secondary Failures	None.
Operator Actions	None.
Min DC Temp	300.1 K (80.5°F) at 3990 s
Comments	None.

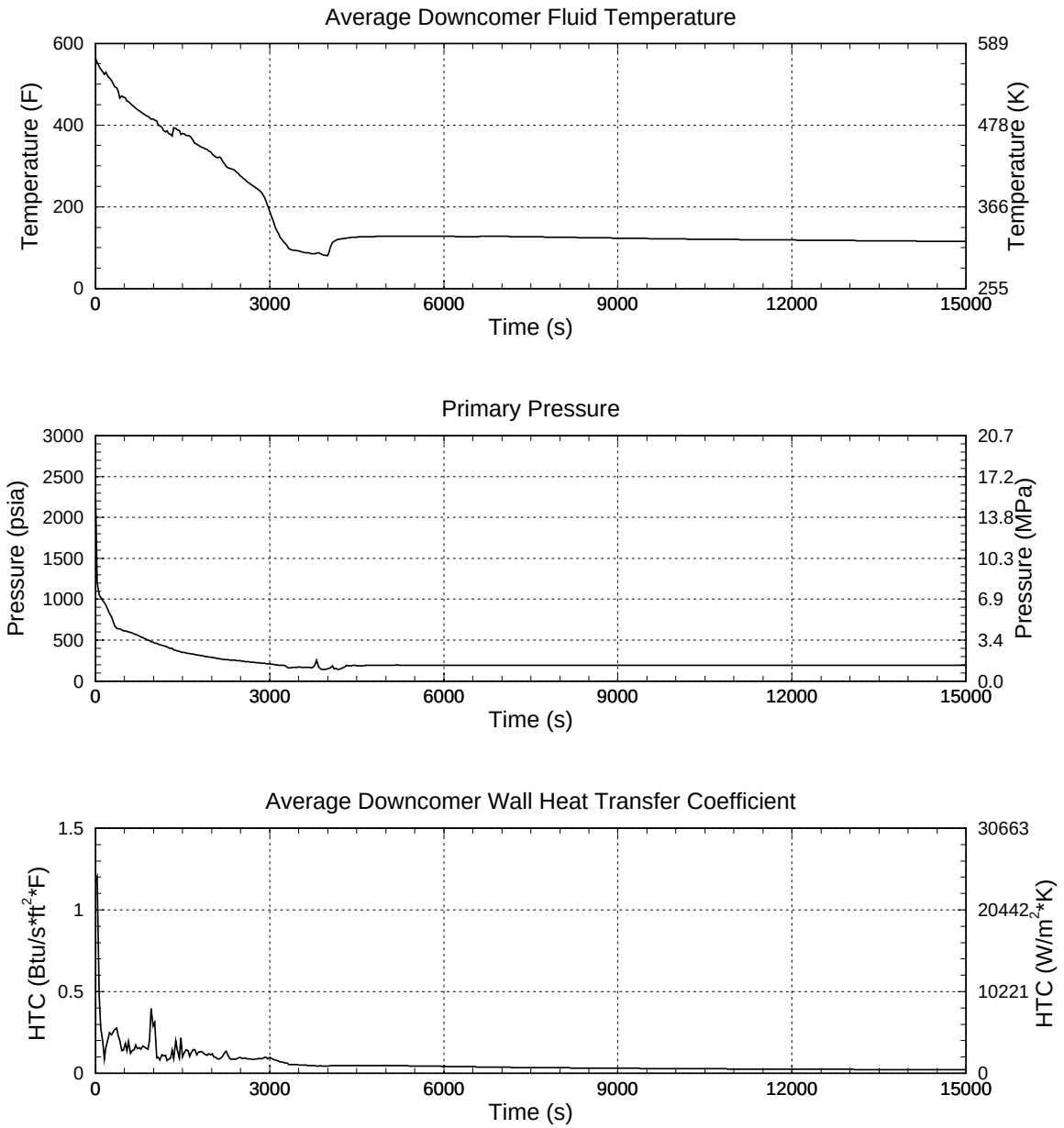


Figure A.2-182: Oconee PTS Results for Case 177