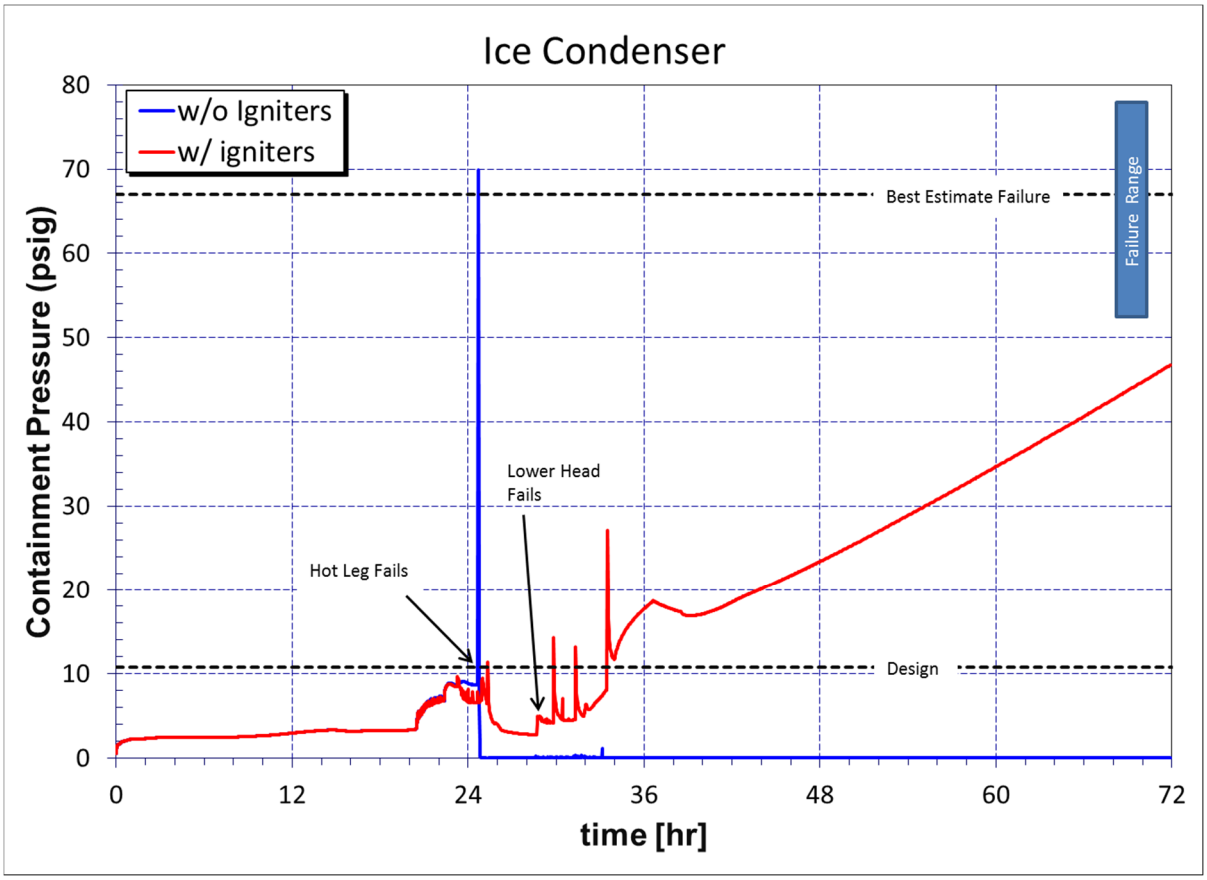
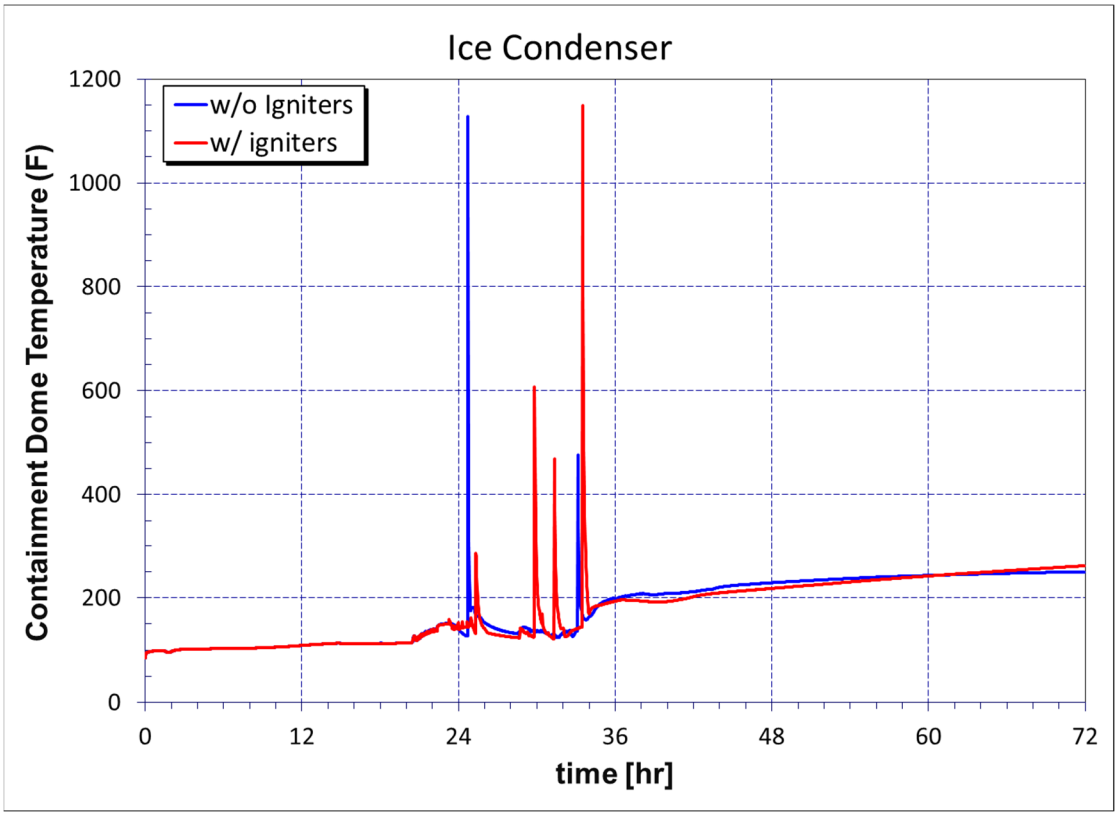
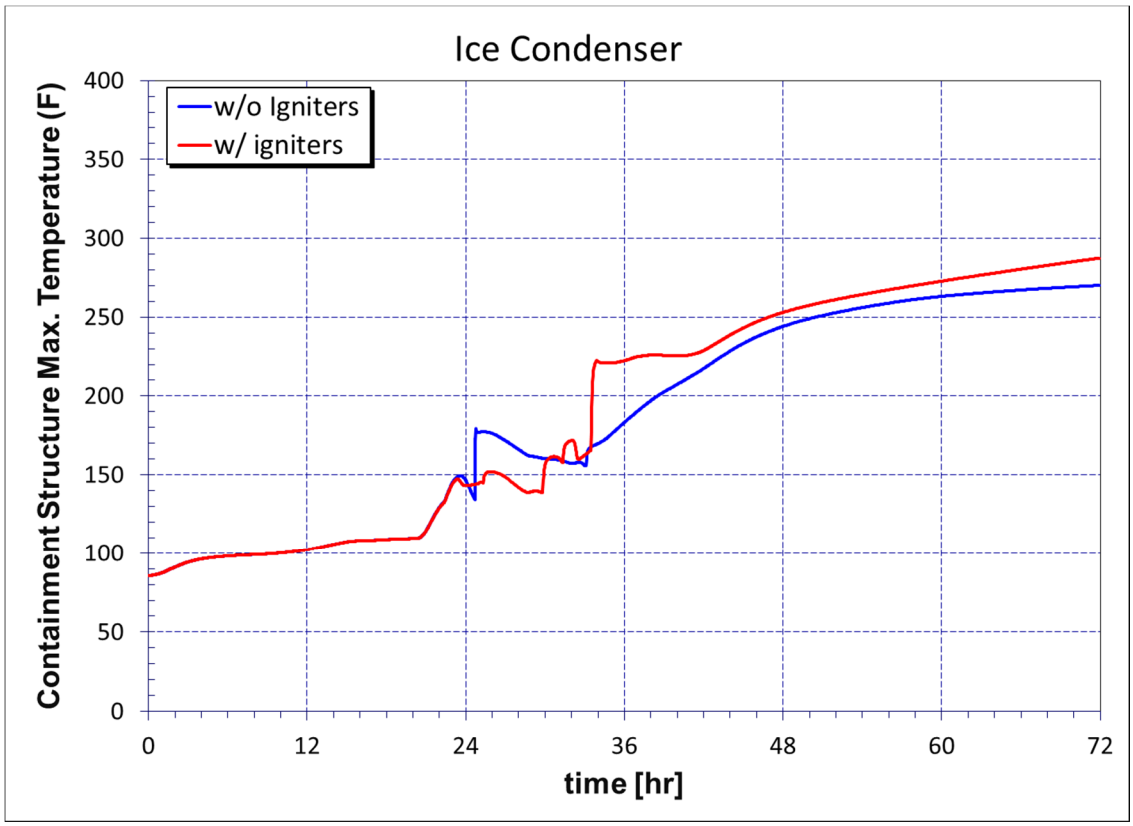
Synopsis of SOARCA Sequoyah analysis discussed in the White Paper, "Closure of Fukushima Tier 3 Recommendations Related to Containment Vents, Hydrogen Control, and Enhanced Instrumentation"

The results and insights of the calculations for selected extended loss of AC power (ELAP) scenarios are briefly discussed. The main objective of the analysis is to show the importance of the igniters in controlling hydrogen and thus the containment pressure. No other means of heat removal is assumed post core damage in these analyses. The MELCOR input model is based on the latest model used in the ongoing Sequoyah SOARCA analysis.

The turbine-driven auxiliary feedwater (TDAFW) system is assumed available until station batteries run out at 8 hours. Core damage occurs shortly before 24 hours followed by hot leg rupture and lower head failure after 24 hours. Without igniters, the containment could fail soon after hot leg rupture, while the igniters can control the combustible gases and limit the containment pressure so that a containment failure is not likely within 72 hours. In addition, while the local gas temperatures in the upper containment can be high due to hydrogen combustion, the maximum structure temperature does not exceed 300 F. The integrity of containment penetrations and prevention of hydrogen migration outside of containment should be maintained at these temperatures.




Ice Condenser
w/o Igniters
w/ igniters
Containment Dome Temperature (F)
1200
1000
800
600
400
200
0
0
12
24
36
48
60
72
time [hr]


Ice Condenser
w/o Igniters
w/ igniters
Containment Structure Max. Temperature (F)
400
350
300
250
200
150
100
50
0
0
12
24
36
48
60
72
time [hr]