

TCF2 Setpoint Schedules

2021-12-15

<https://github.com/NREL/gbxml-to-openstudio/issues/98>

<https://jira.autodesk.com/browse/INSIM-1250>

Summary

- This document summarizes the results for (7) gbXML files from the GreenBuildingXML's sample files¹.
 - (8) files had errors during the EnergyPlus simulation and did not produce an OpenStudio model.
- Results show before and after fixes to the setpoint schedules (thermostats).
- The fix² uses the well-established OpenStudio Standards library³ to determine the occupancy schedules for thermal zones, rather than the existing gbxml-to-openstudio code with the bug.
- The fix will produce smaller OpenStudio models that are more transparent to users.
- The fix will produce different energy regression results from some models due to the setpoint schedule changes.

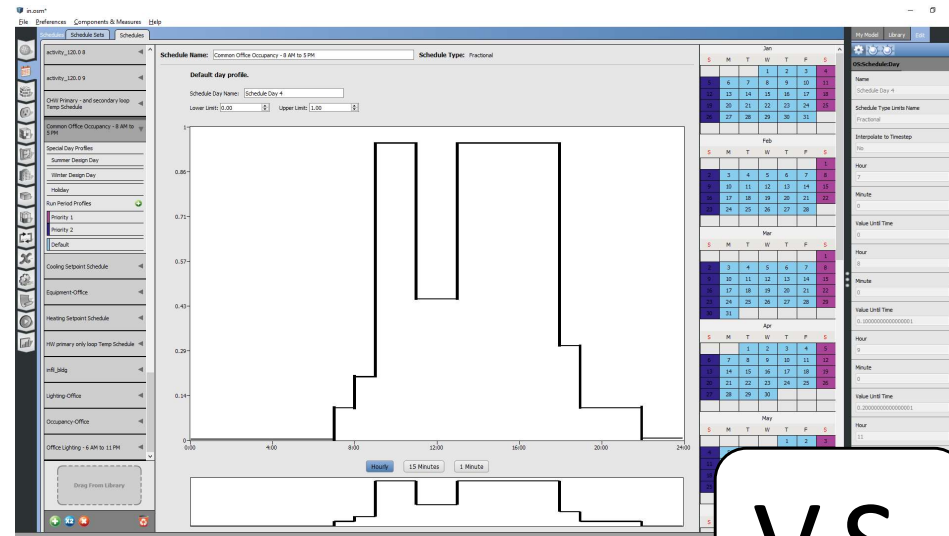
¹ https://github.com/GreenBuildingXML/Sample_gbXML_Files

² <https://github.com/NREL/gbxml-to-openstudio/pull/99>

³ <https://github.com/NREL/openstudio-standards>

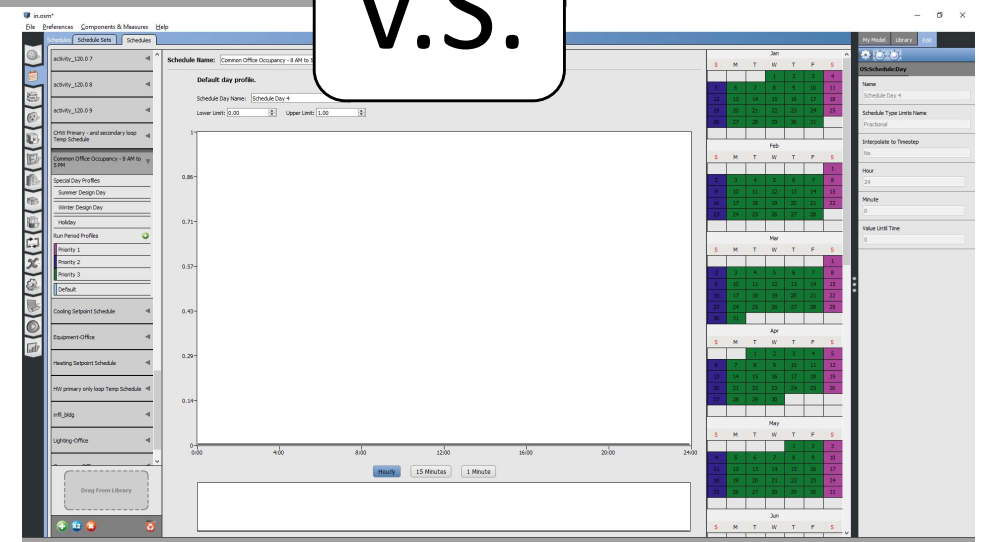
Notes

- In OpenStudio, “Default” schedules can be overridden by a “Priority” schedule.
- Making the **Default** schedule the primary most-used one (e.g. Mon-Fri schedule), rather than a **Priority** schedule has the following benefits.
 - Reduces the number of schedule objects in the model.
 - Makes the model more transparent by showing the most-used schedule to the user more readily.
- The existing code assumes the following.
 - 5F (~3C) setback temperature during unoccupied times.
 - 1.5h warmup/cooldown prior to occupancy



- **Default** schedule (Mon-Fri) is most-used
- **Priority** schedules (**Sat**, **Sun**) override **Default**

- **Default** schedule isn't used
- **Priority** schedules (**Mon-Fri**, **Sat**, **Sun**) override **Default**

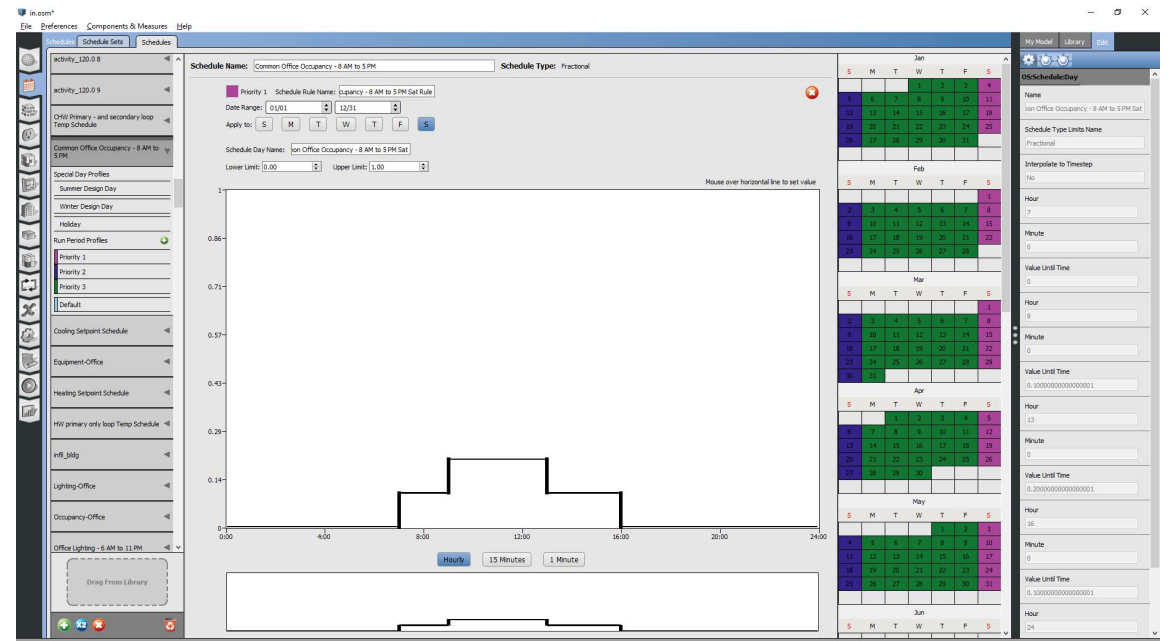
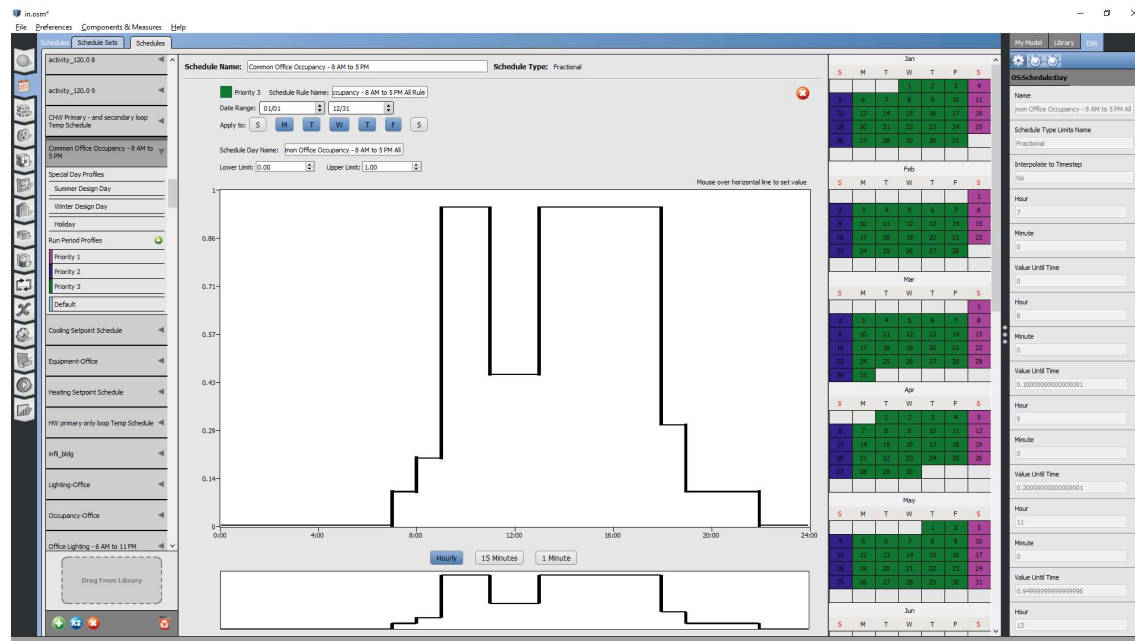


gbXMLExport_ASHRAEHQ_Revit2017.xml

gbXMLExport_ASHRAEHQ_Revit2017.xml Occupancy

Occupancy – **Mon to Fri**

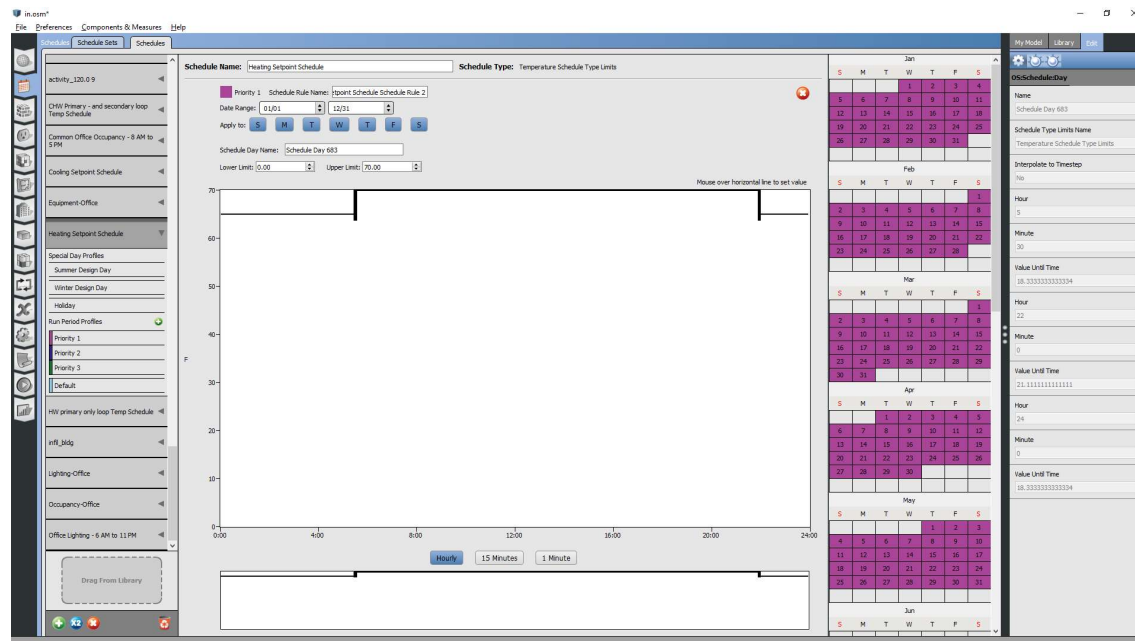
Occupancy – **Sat** (unoccupied **Sun**)



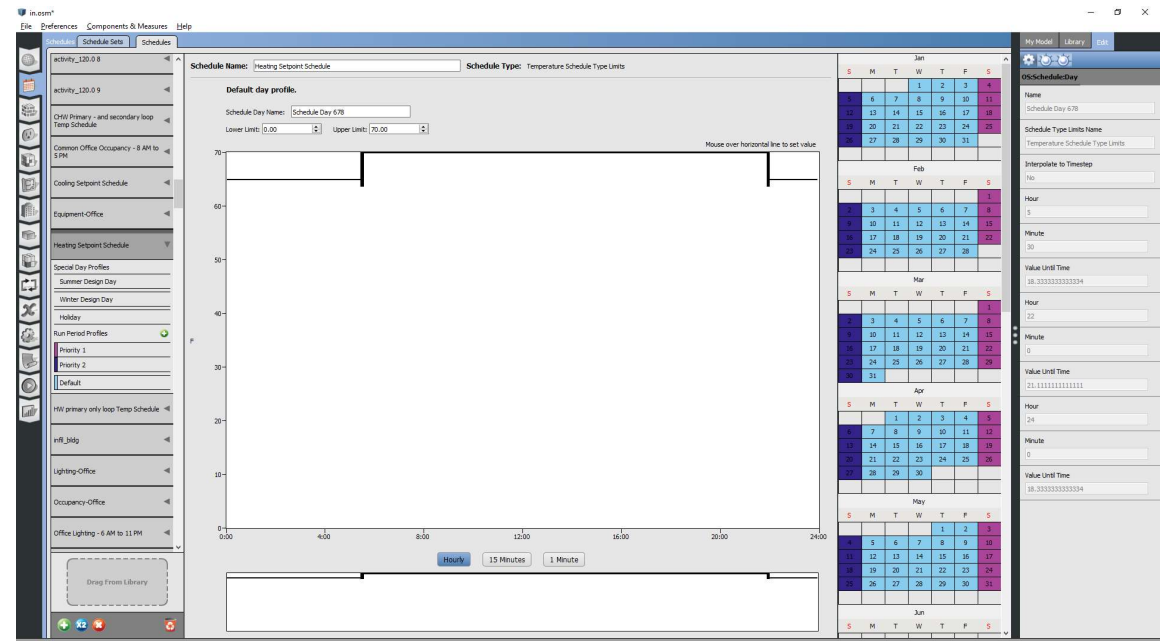
gbXMLExport_ASHRAEHQ_Revit2017.xml

designHeatT = 70.0F

Mon to Fri Heating – Before



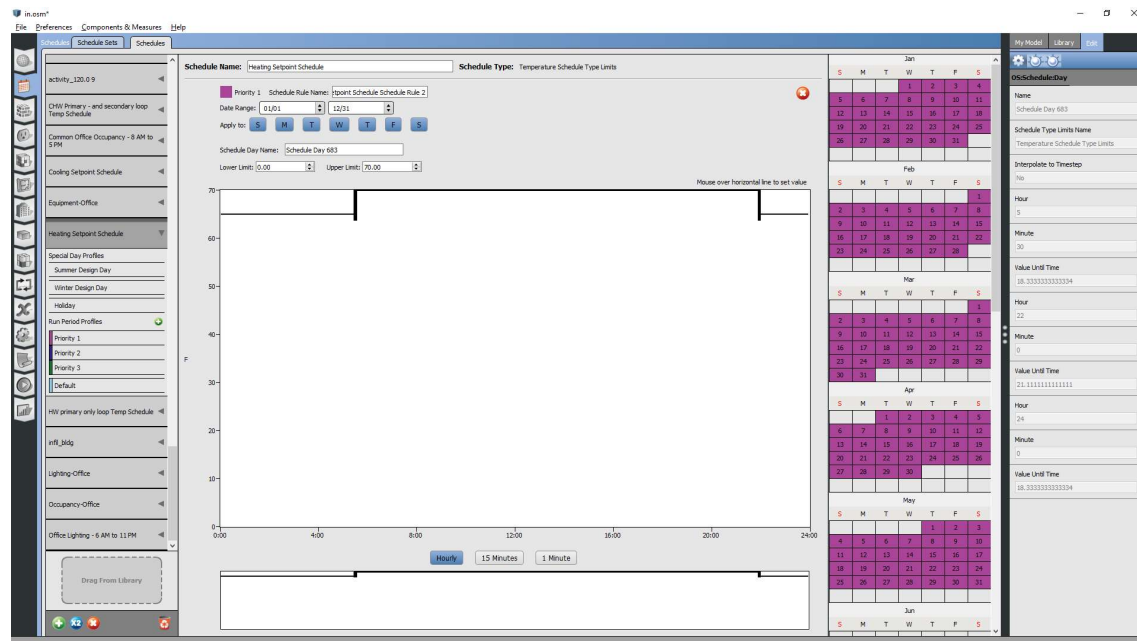
Mon to Fri Heating – After



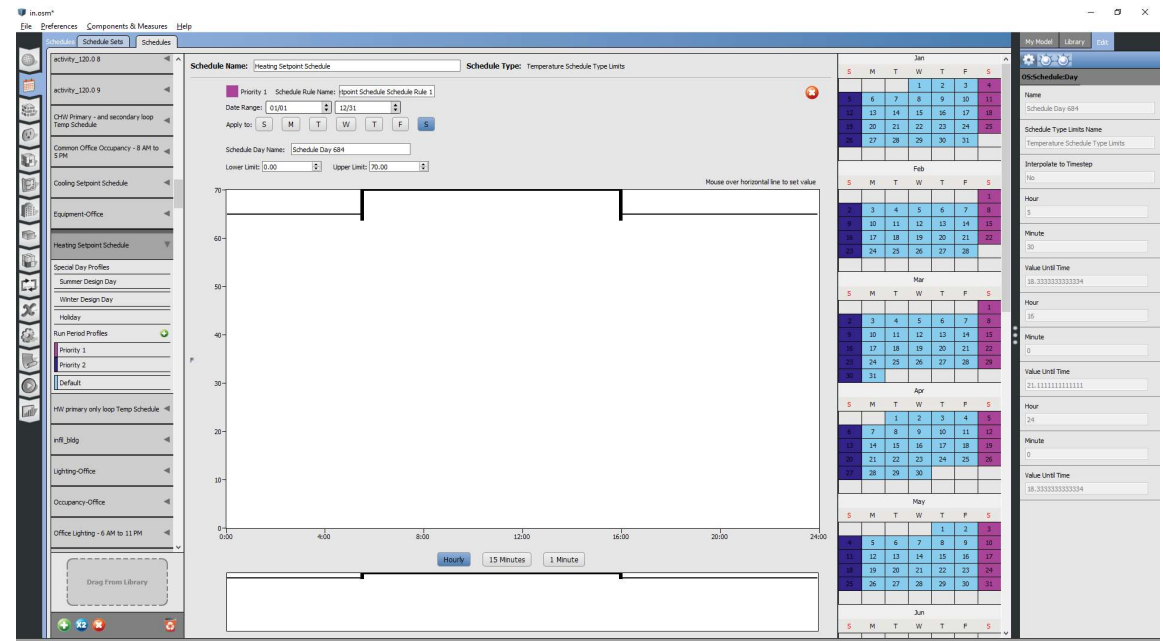
gbXMLExport_ASHRAEHQ_Revit2017.xml

designHeatT = 70.0F

Sat Heating – Before



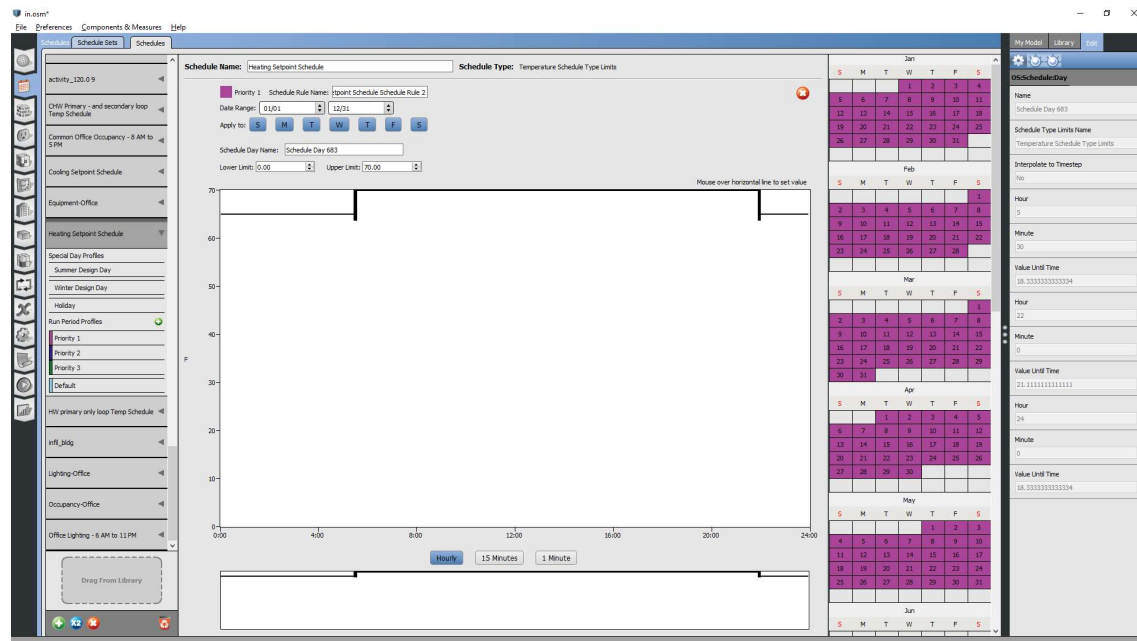
Sat Heating – After



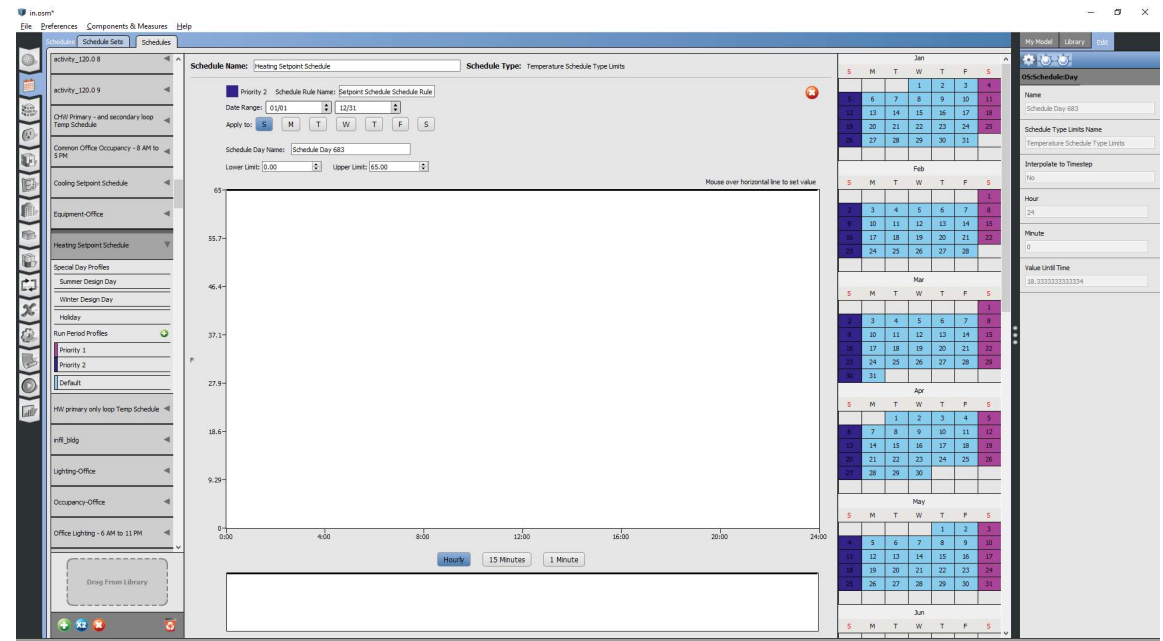
gbXMLExport_ASHRAEHQ_Revit2017.xml

designHeatT = 70.0F

Sun Heating – Before



Sun Heating – After

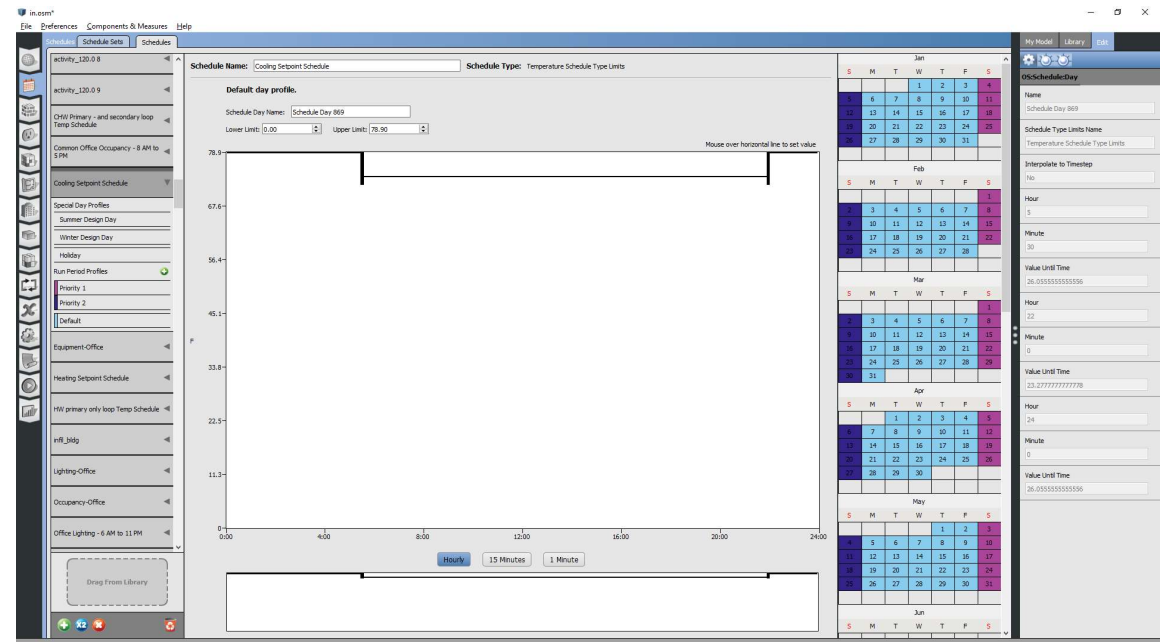
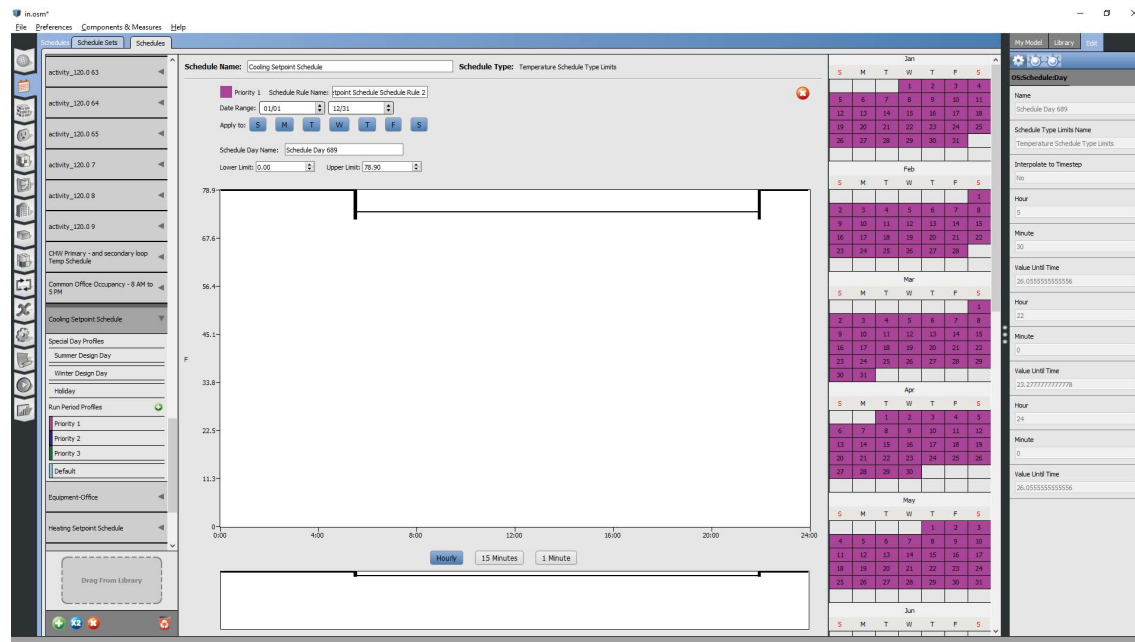


gbXMLExport_ASHRAEHQ_Revit2017.xml

designCoolT = 73.9F

Mon to Fri Cooling – Before

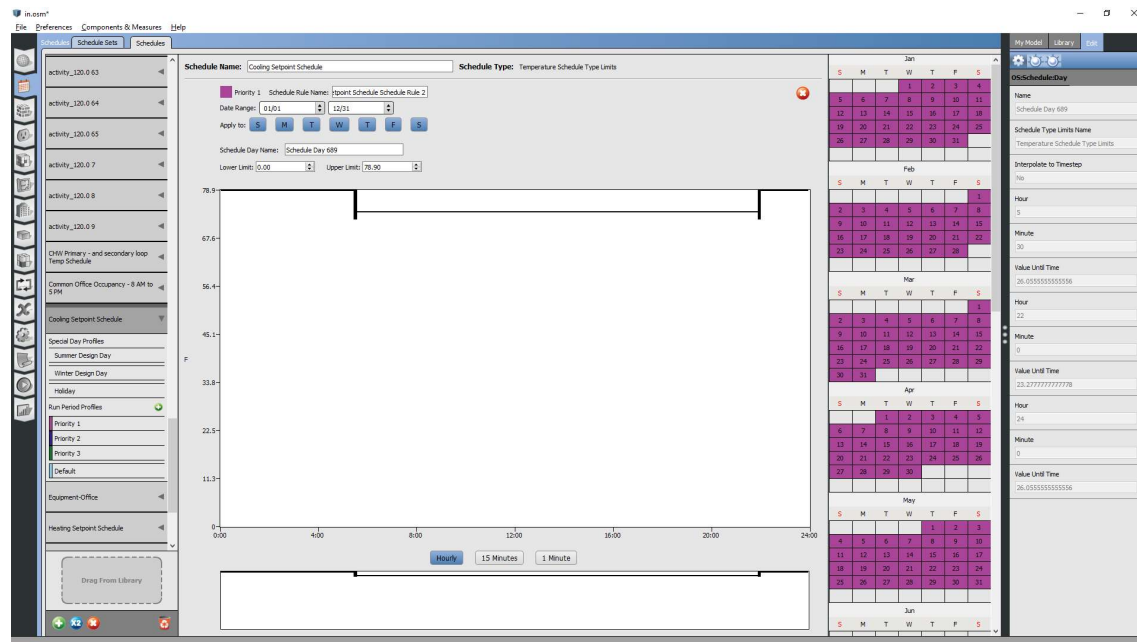
Mon to Fri Cooling – After



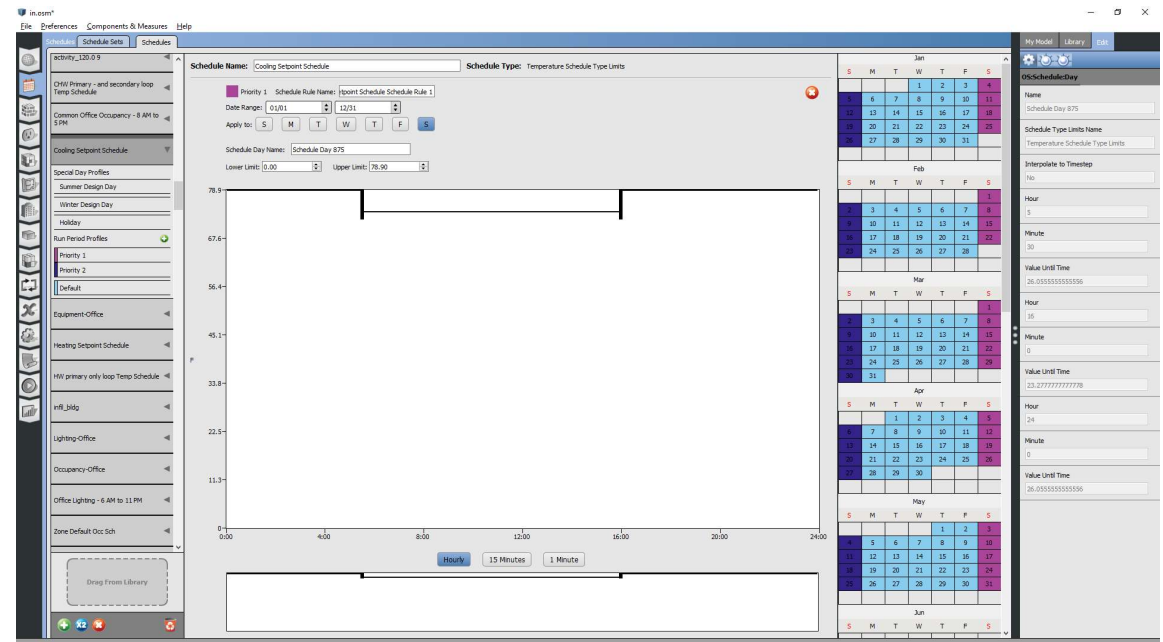
gbXMLExport_ASHRAEHQ_Revit2017.xml

designCoolT = 73.9F

Sat Cooling – Before



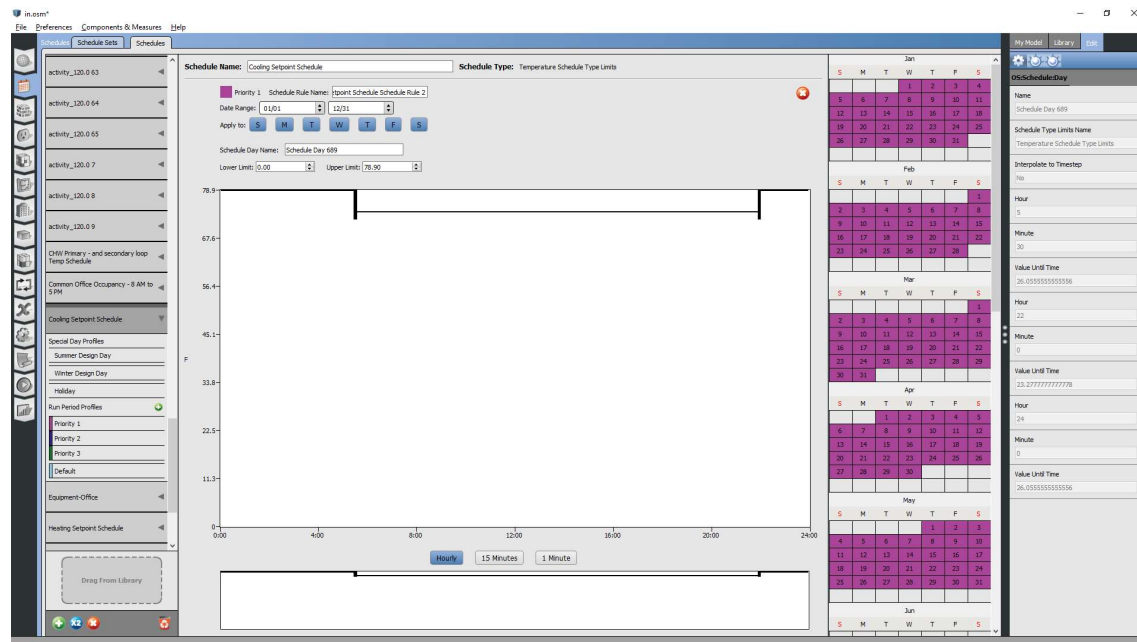
Sat Cooling – After



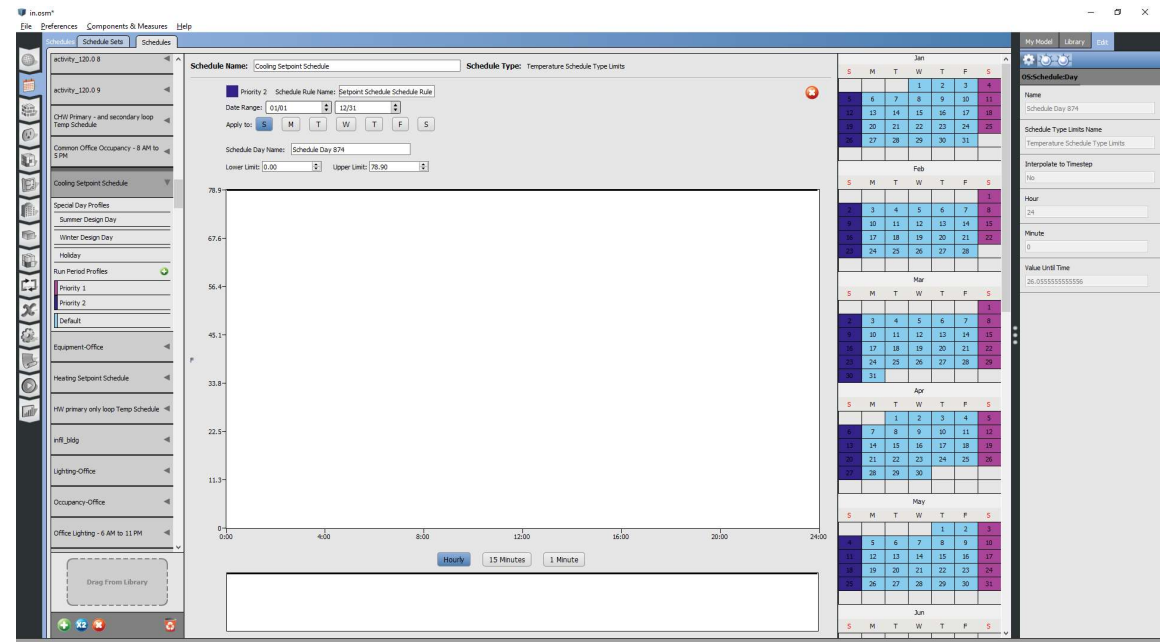
gbXMLExport_ASHRAEHQ_Revit2017.xml

designCoolT = 73.9F

Sun Cooling – Before



Sun Cooling – After

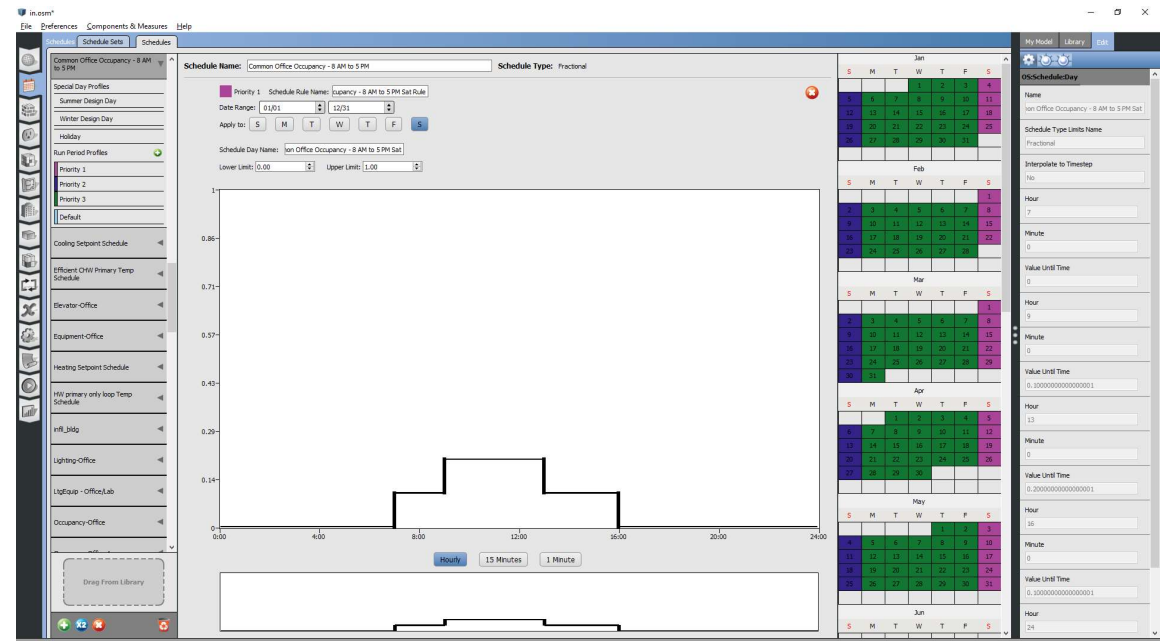
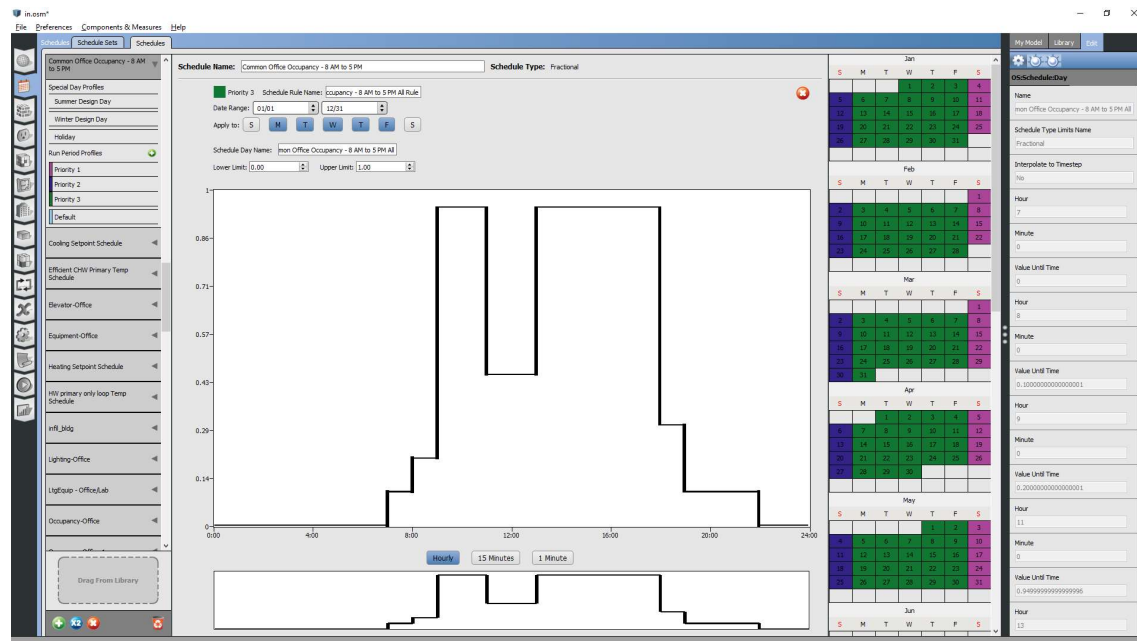


gbXMLStandard_Office_(ASHRAE_HQ)_2016.xml

gbXMLStandard_Office_(ASHRAE_HQ)_2016.xml Occupancy

Occupancy – **Mon to Fri**

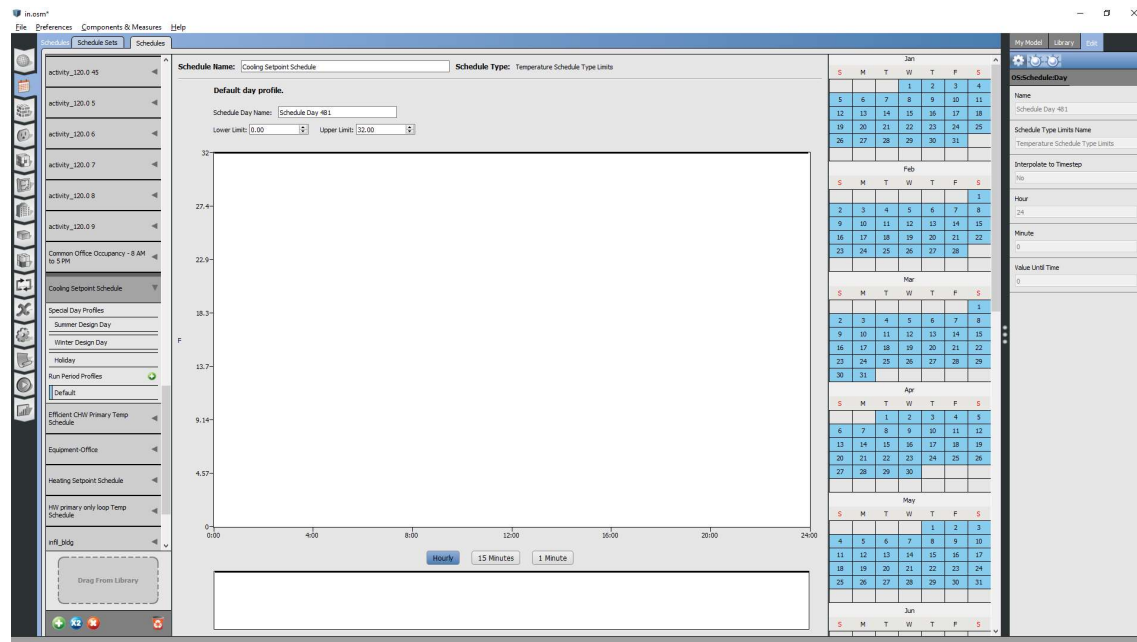
Occupancy – **Sat** (unoccupied **Sun**)



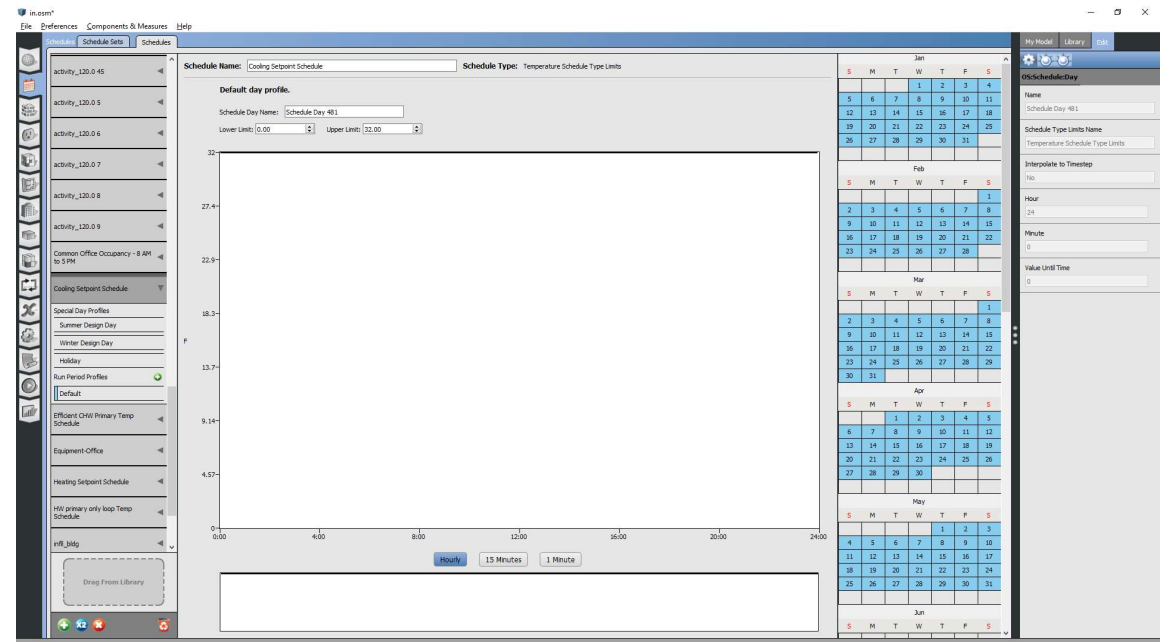
gbXMLStandard_Office_(ASHRAE_HQ)_2016.xml

designCoolT = 73.9F (unconditioned)

Cooling Default – Before



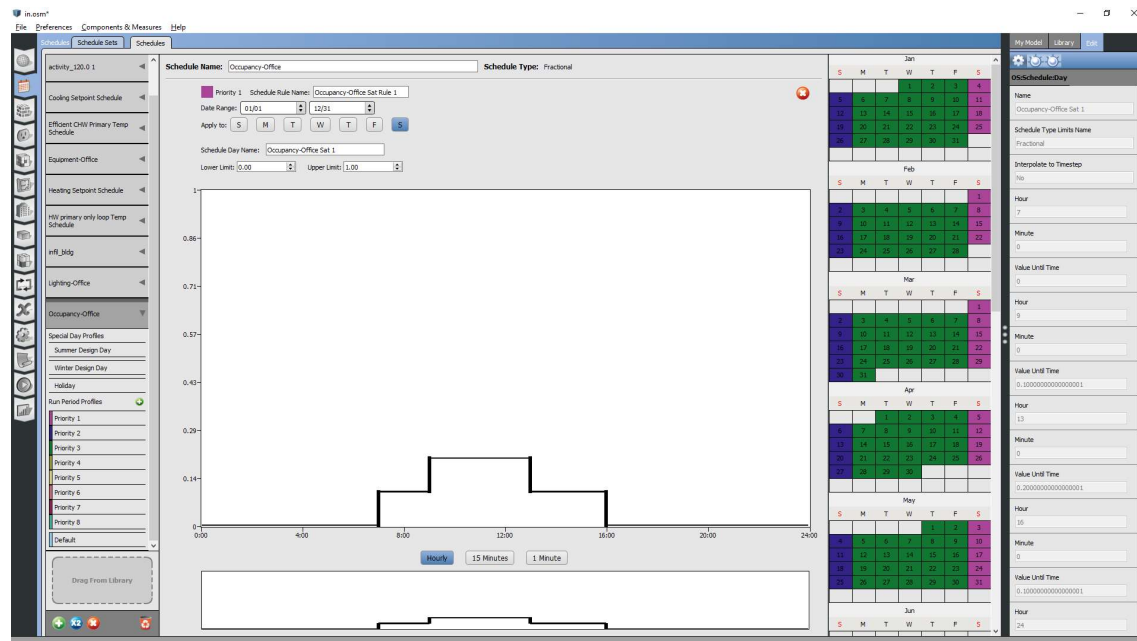
Cooling Default – After



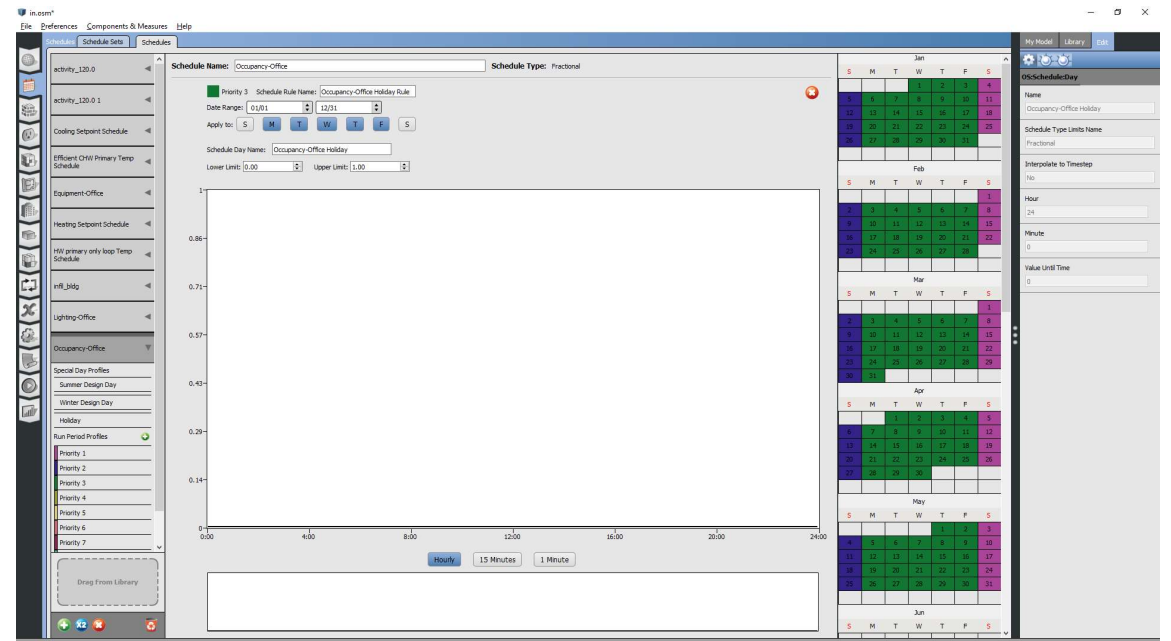
gbXMLStandard_Office_(Core_&_Shell)_2016.xml

gbXMLStandard_Office_(Core_&_Shell)_2016.xml Occupancy

Occupancy – Sat

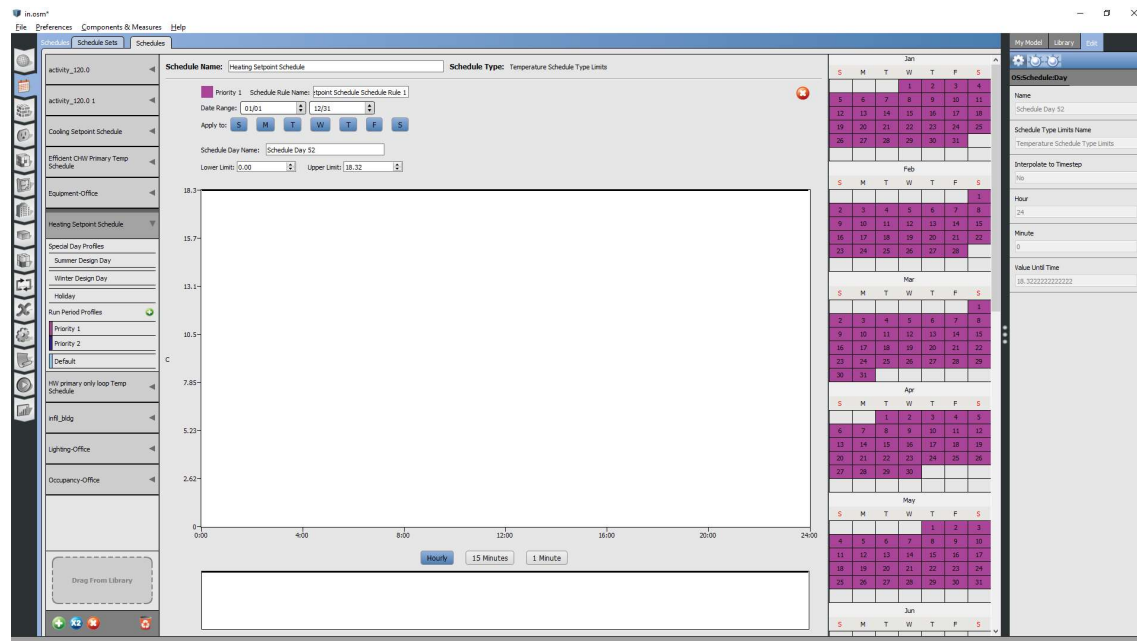


Occupancy – Mon to Fri (and Sun)

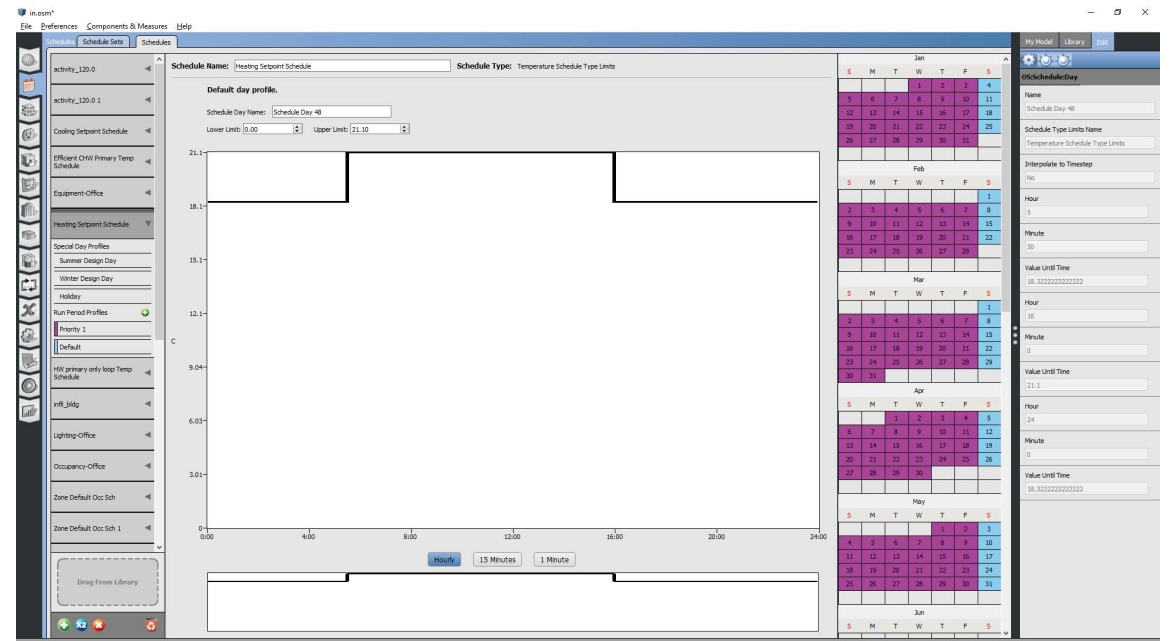


gbXMLStandard_Office_(Core_&_Shell)_2016.xml designHeatT = 21.1C

Sat Heating – Before



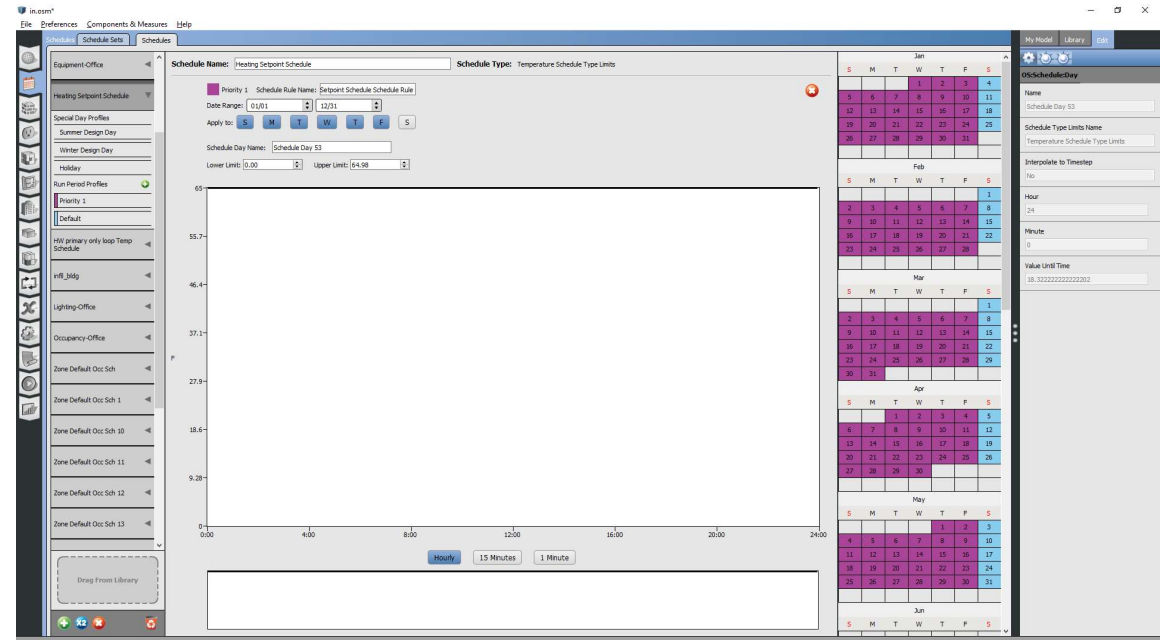
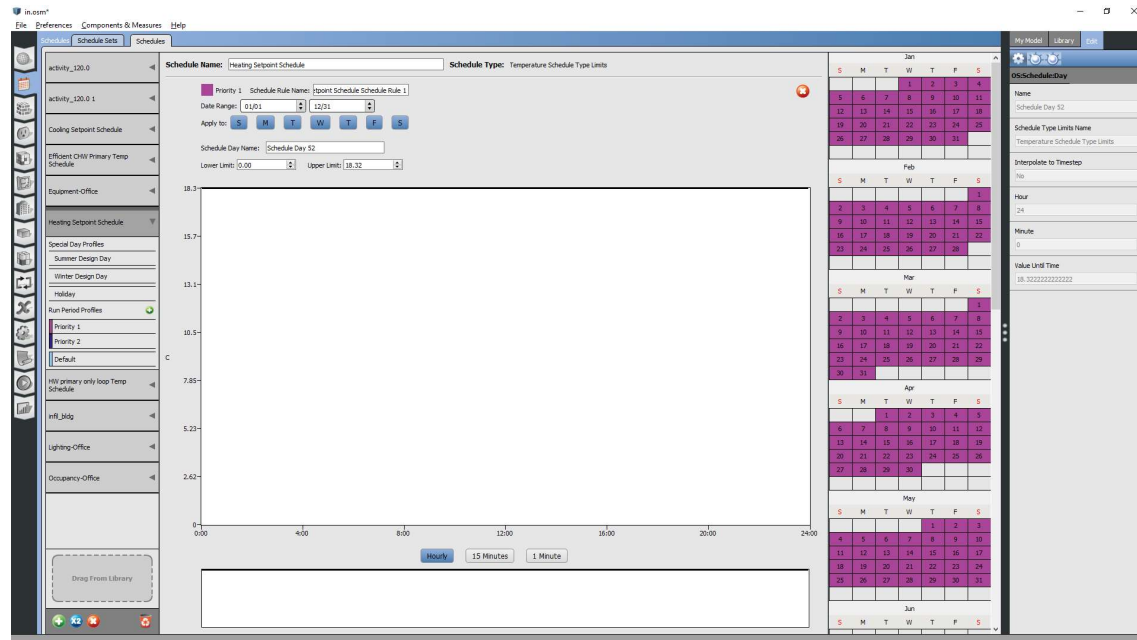
Sat Heating – After



gbXMLStandard_Office_(Core_&_Shell)_2016.xml designHeatT = 21.1C

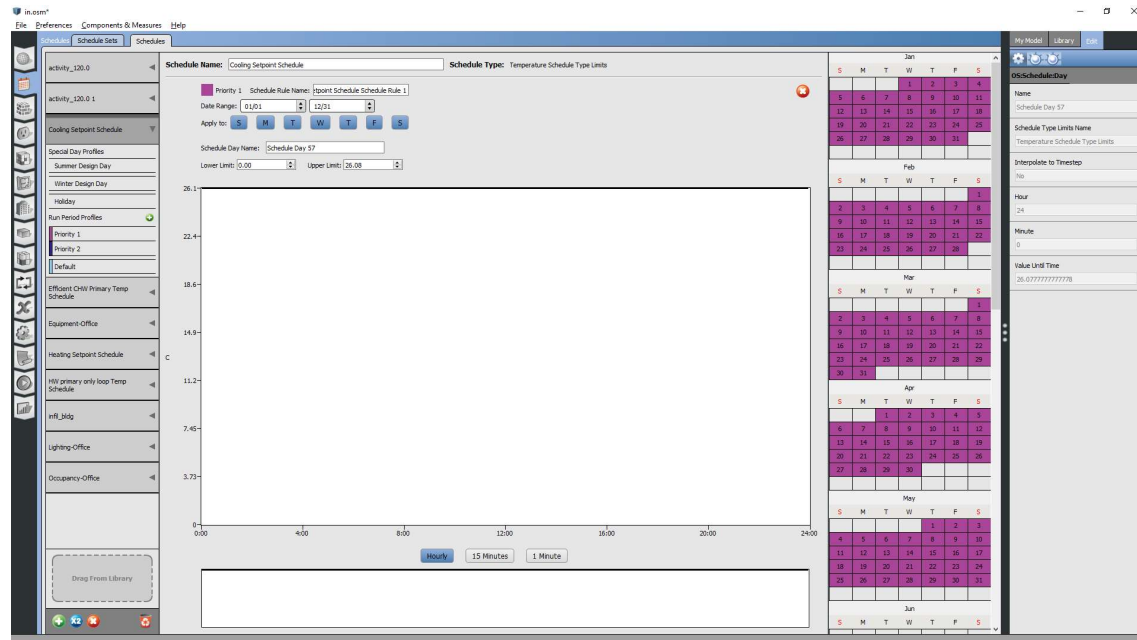
Mon to Fri (and Sun) Heating – Before

Mon to Fri (and Sun) Heating – After

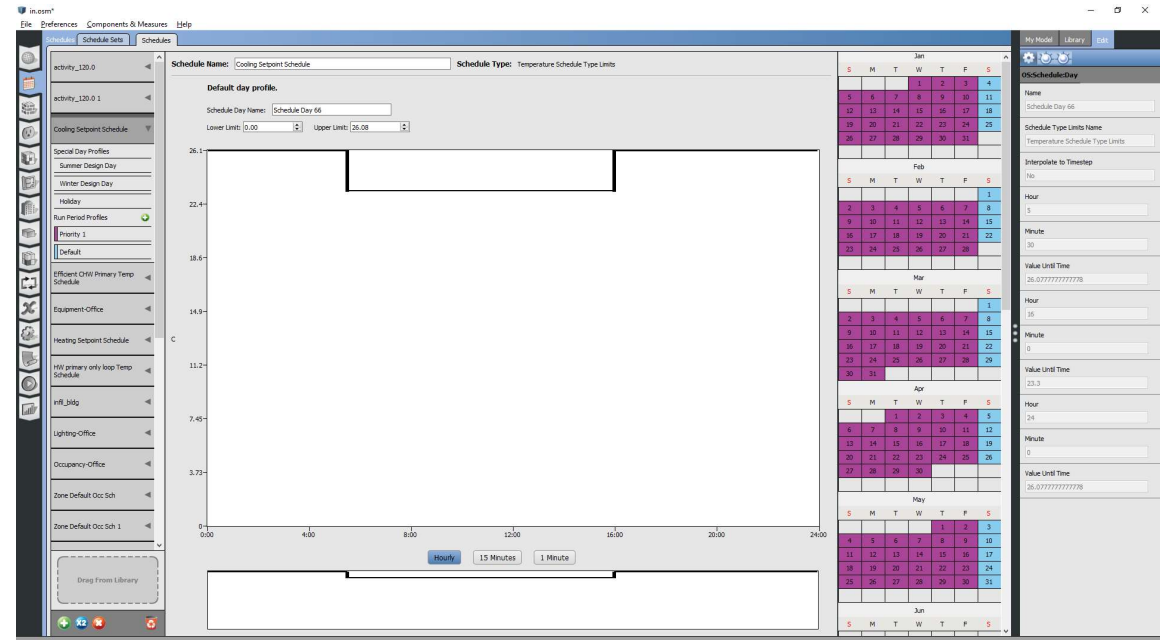


gbXMLStandard_Office_(Core_&_Shell)_2016.xml designCoolT = 23.3C

Sat Cooling – Before



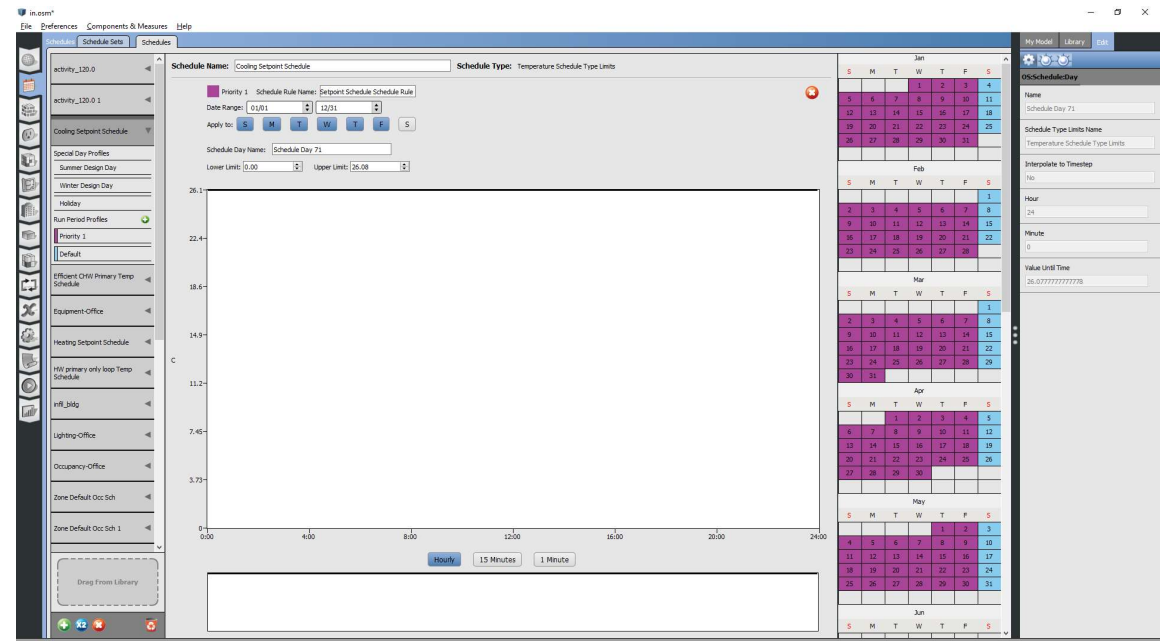
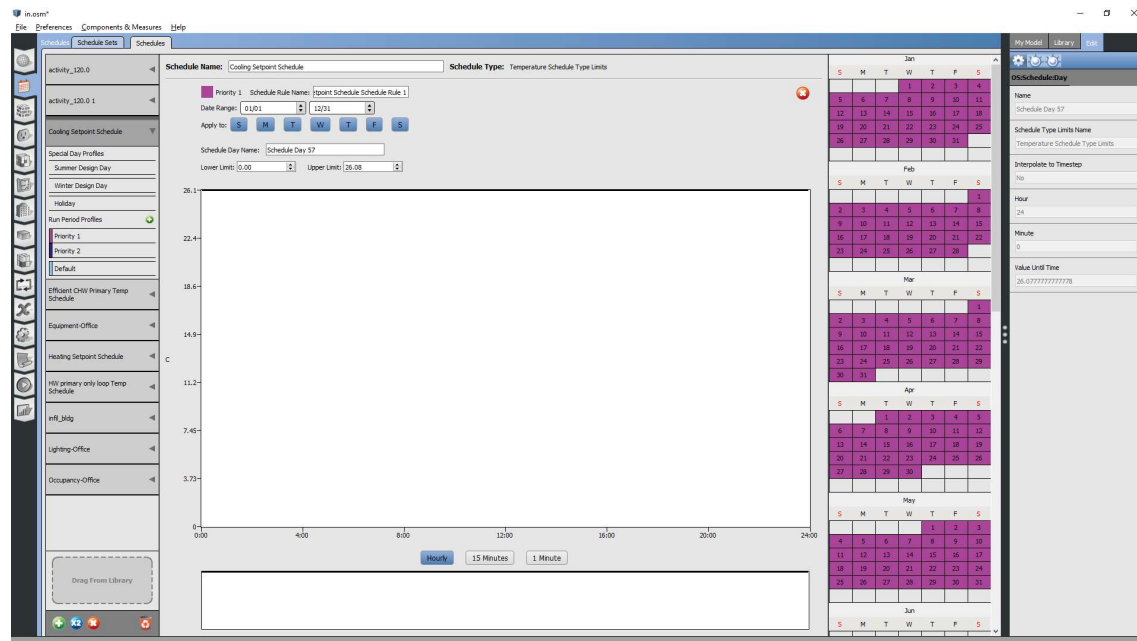
Sat Cooling – After



gbXMLStandard_Office_(Core_&_Shell)_2016.xml designCoolT = 23.3C

Mon to Fri (and Sun) Cooling – Before

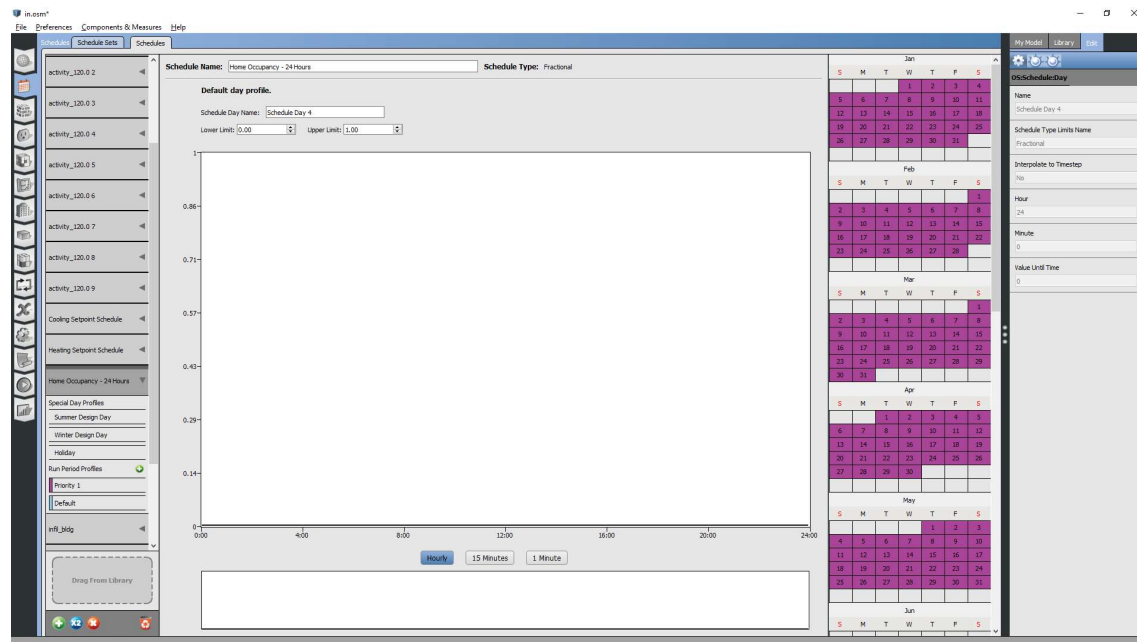
Mon to Fri (and Sun) Cooling – After



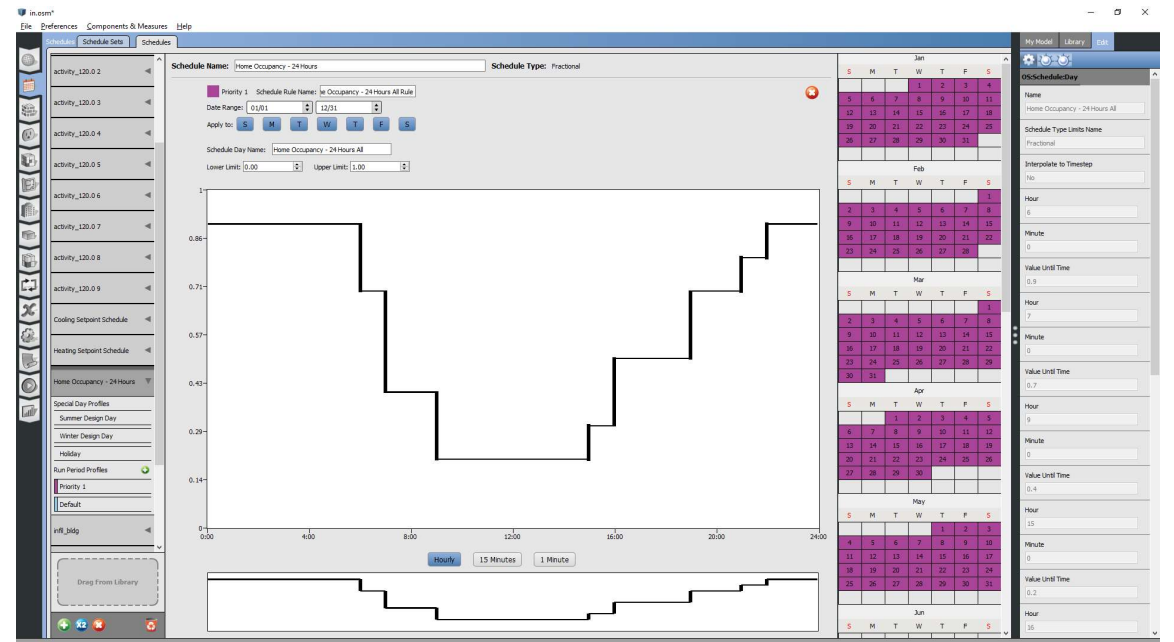
gbXMLStandard_Single_Family_Residential_2016.xml

gbXMLStandard_Single_Family_Residential_2016.xml Occupancy

Occupancy – Default

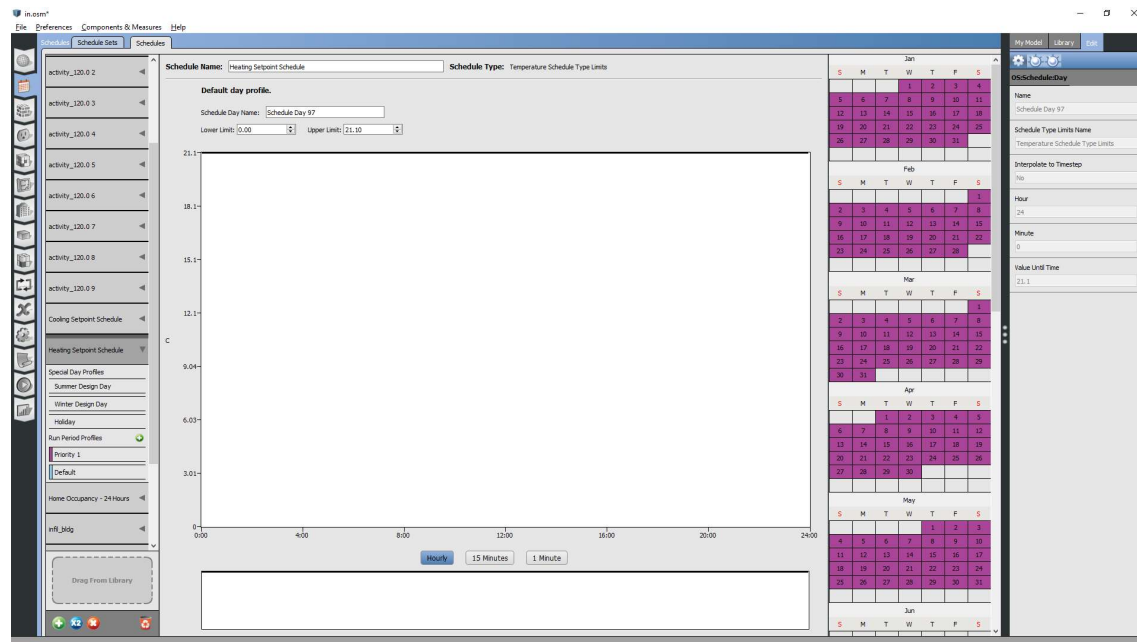


Occupancy – Priority 1

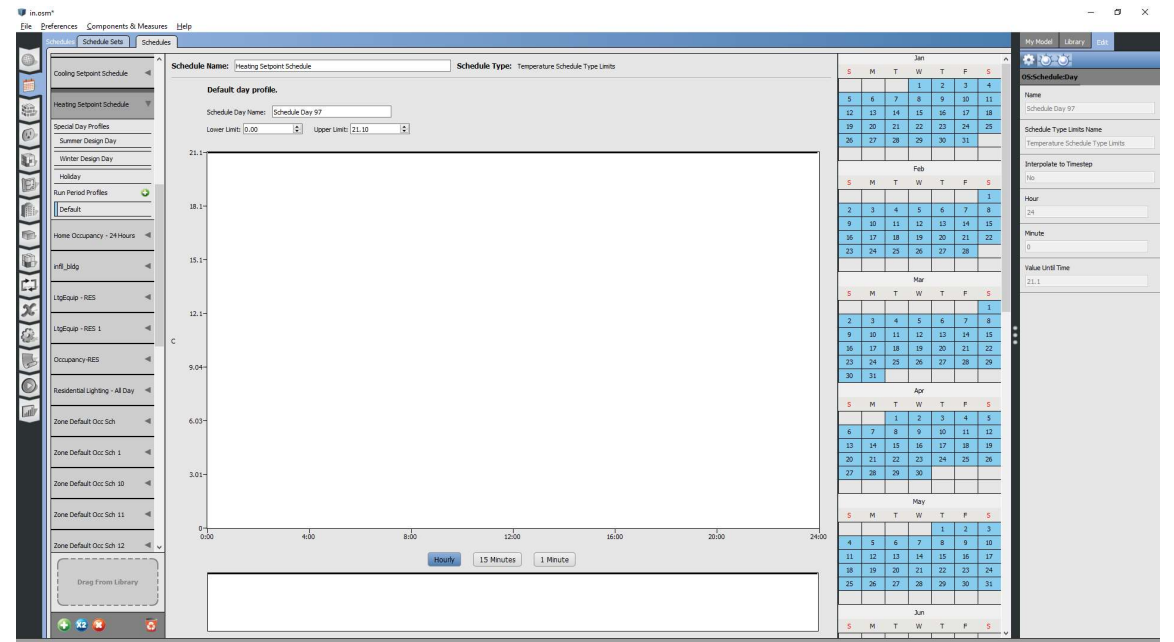


gbXMLStandard_Single_Family_Residential_2016.xml designHeatT = 21.1C

Heating Default – Before



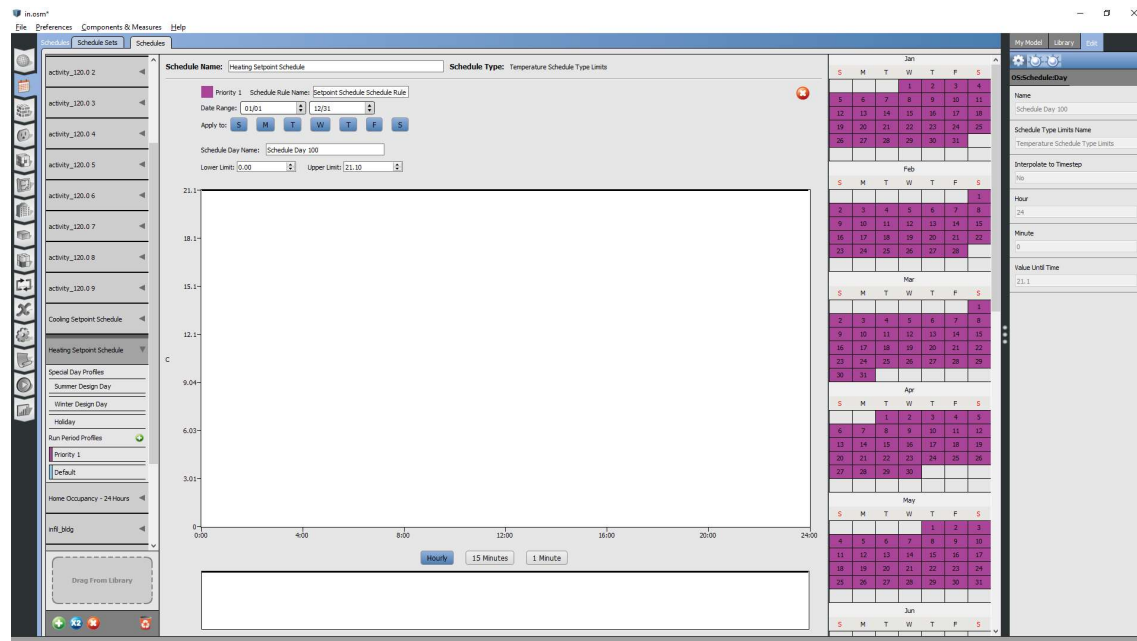
Heating Default – After



gbXMLStandard_Single_Family_Residential_2016.xml

designHeatT = 21.1C

Heating Priority 1 – Before

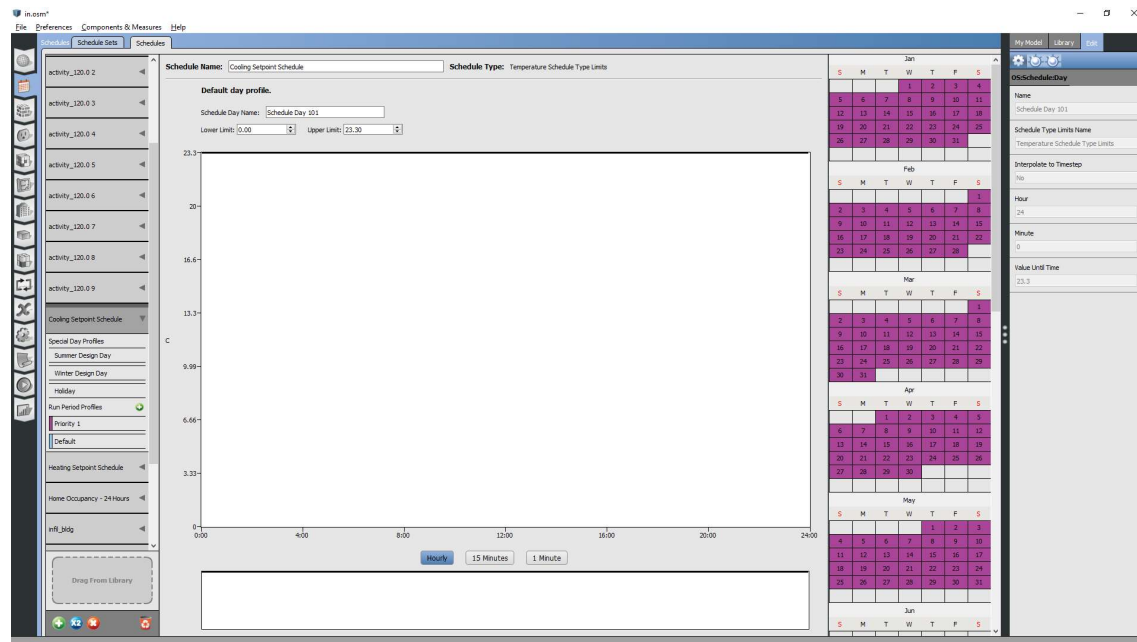


Heating Priority 1 – After

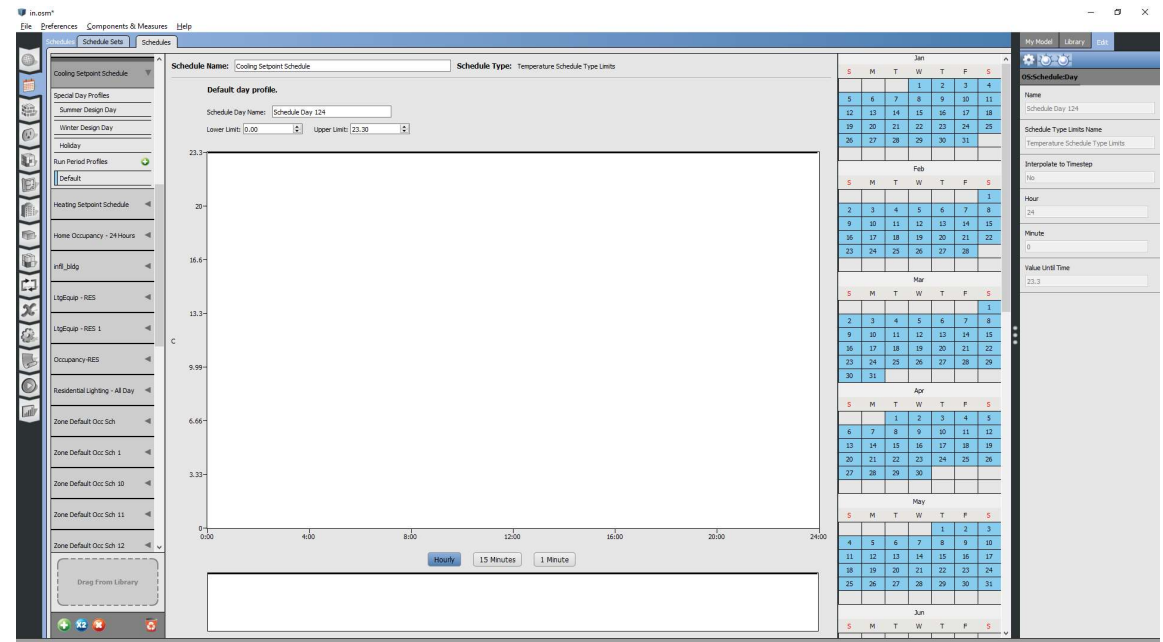
NA

gbXMLStandard_Single_Family_Residential_2016.xml designCoolT = 23.3C

Cooling Default – Before

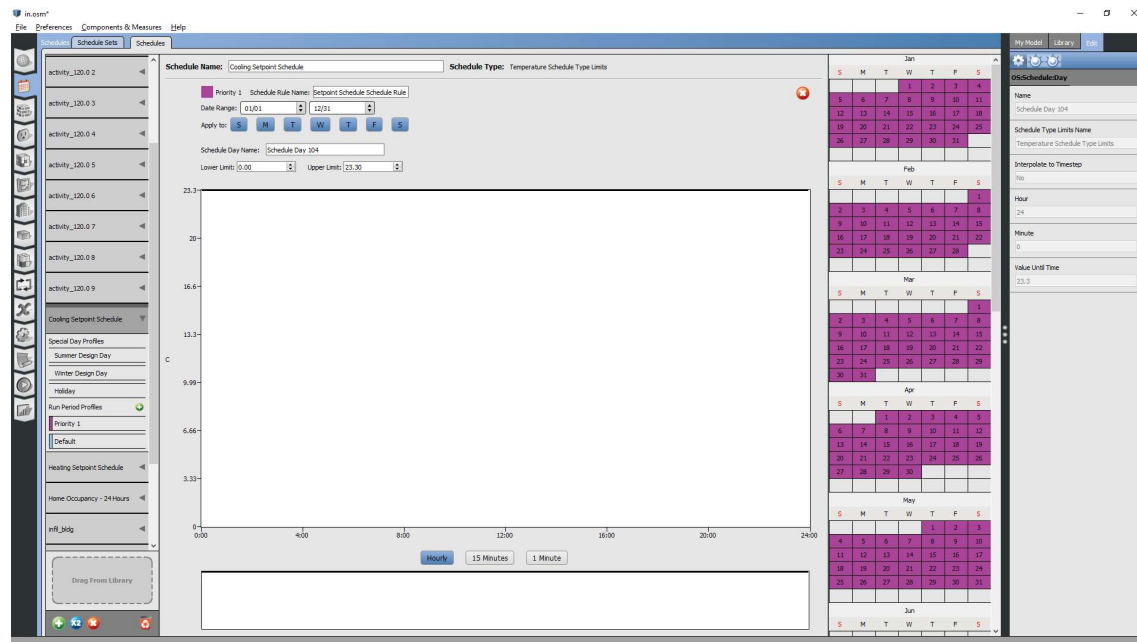


Cooling Default – After



gbXMLStandard_Single_Family_Residential_2016.xml designCoolT = 23.3C

Cooling Priority 1 – Before



Cooling Priority 1 – After

NA

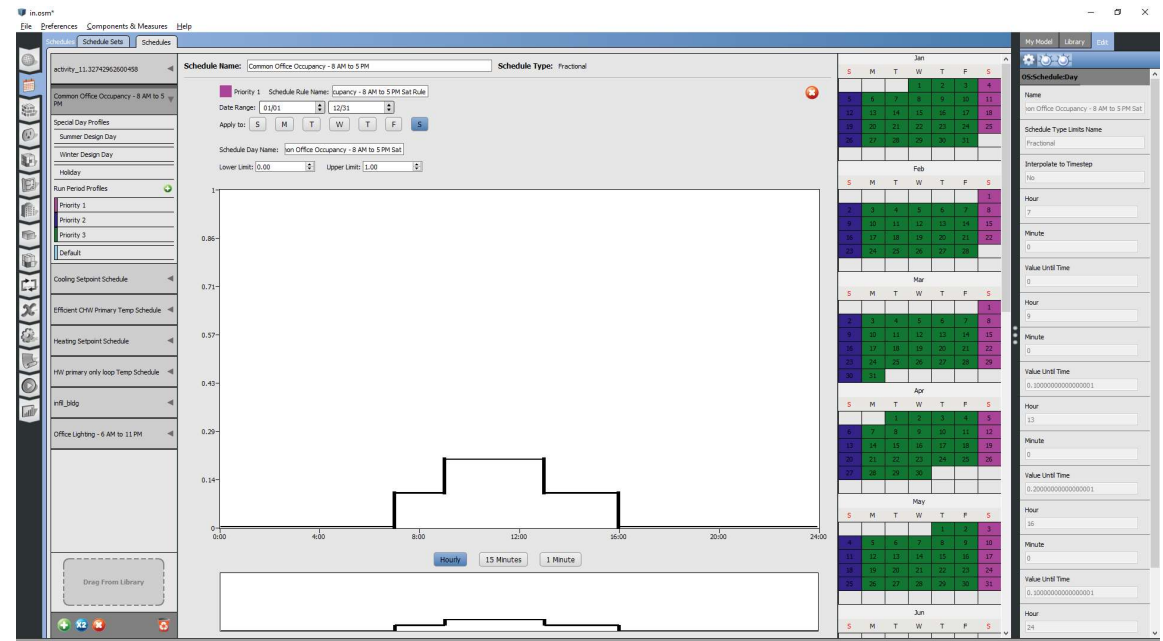
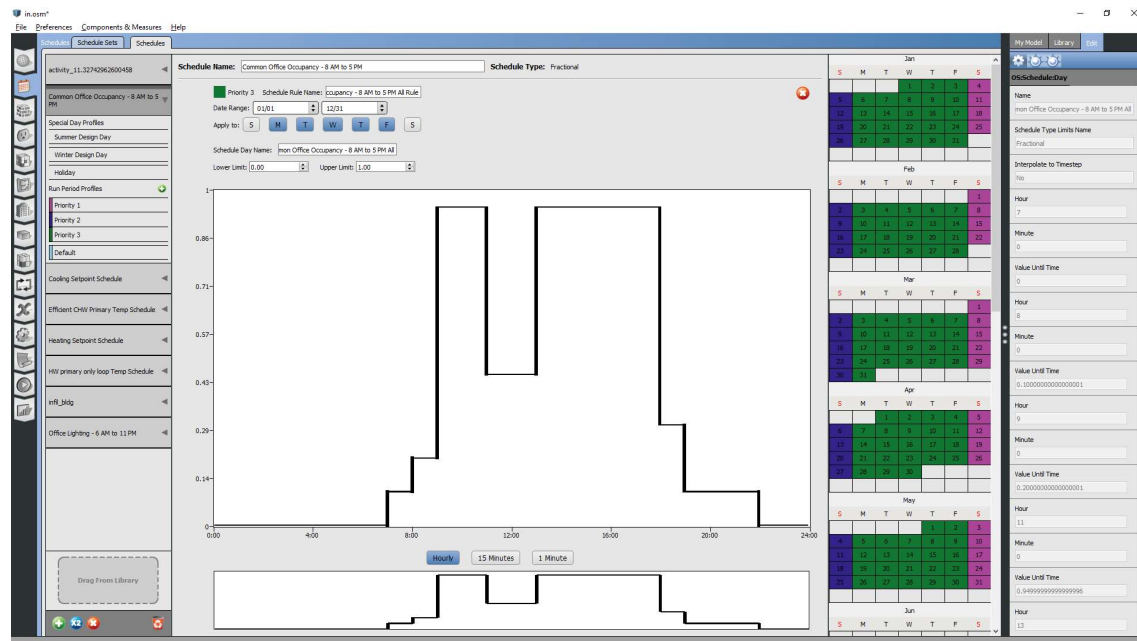
gbXMLStandard_Test_Model_2016.xml

gbXMLStandard_Test_Model_2016.xml

Occupancy

Occupancy – **Mon to Fri**

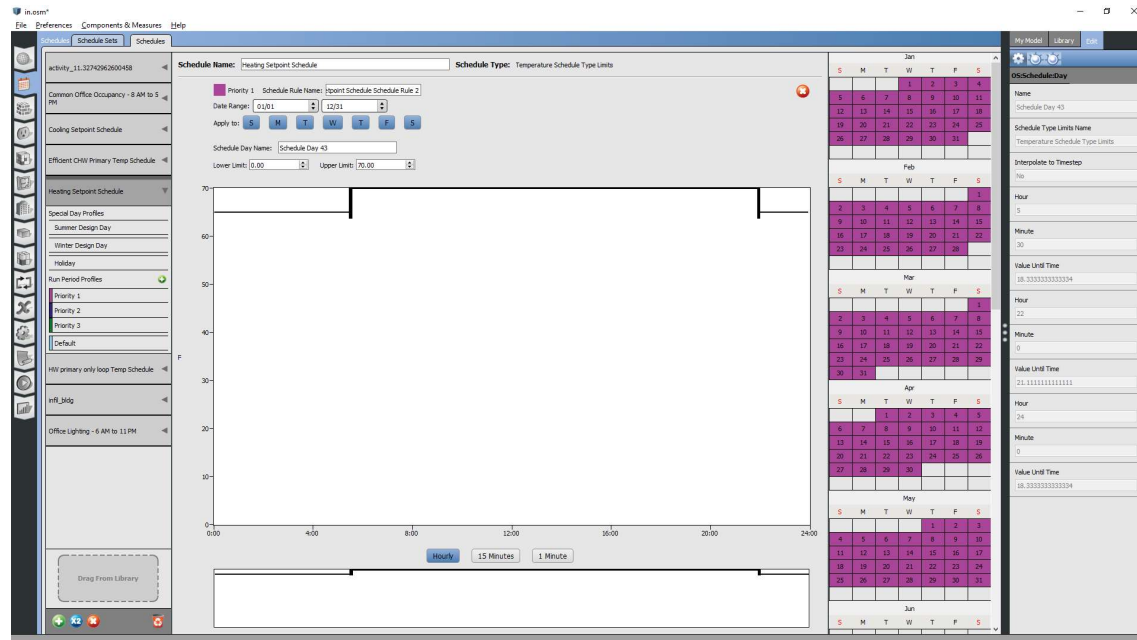
Occupancy – **Sat** (unoccupied **Sun**)



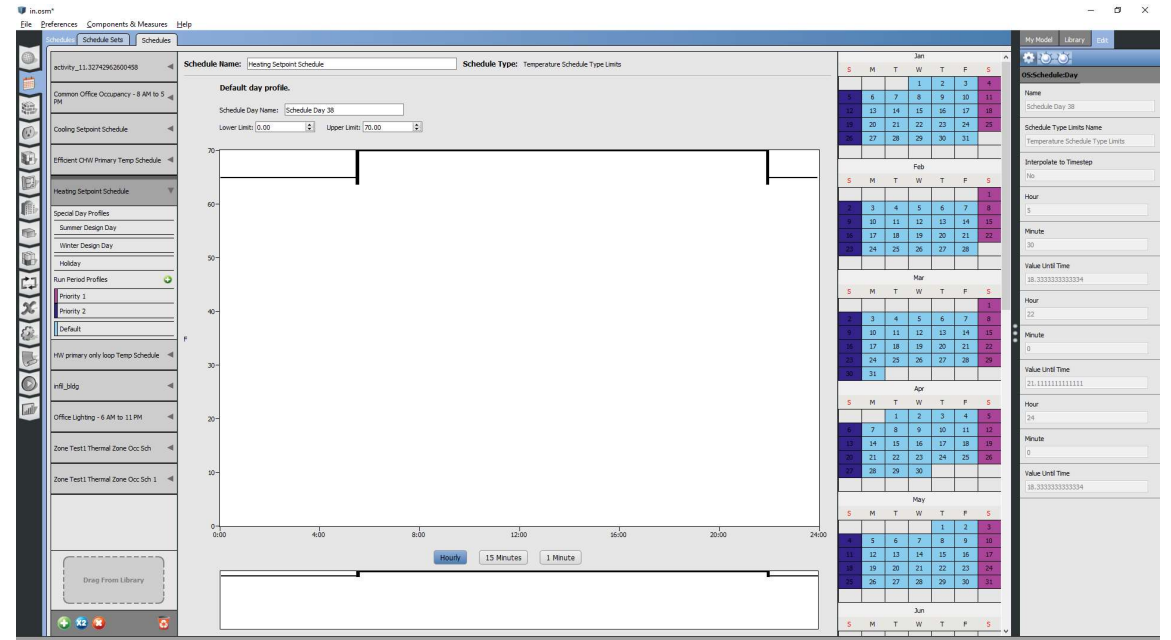
gbXMLStandard_Test_Model_2016.xml

designHeatT = 70.0F

Mon to Fri Heating – Before



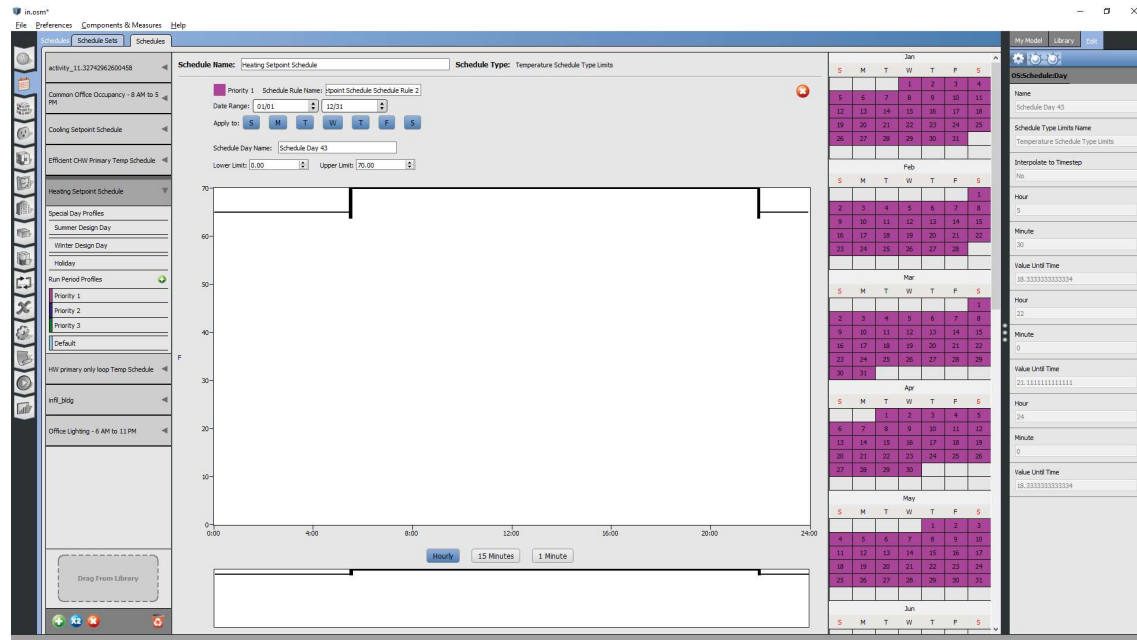
Mon to Fri Heating – After



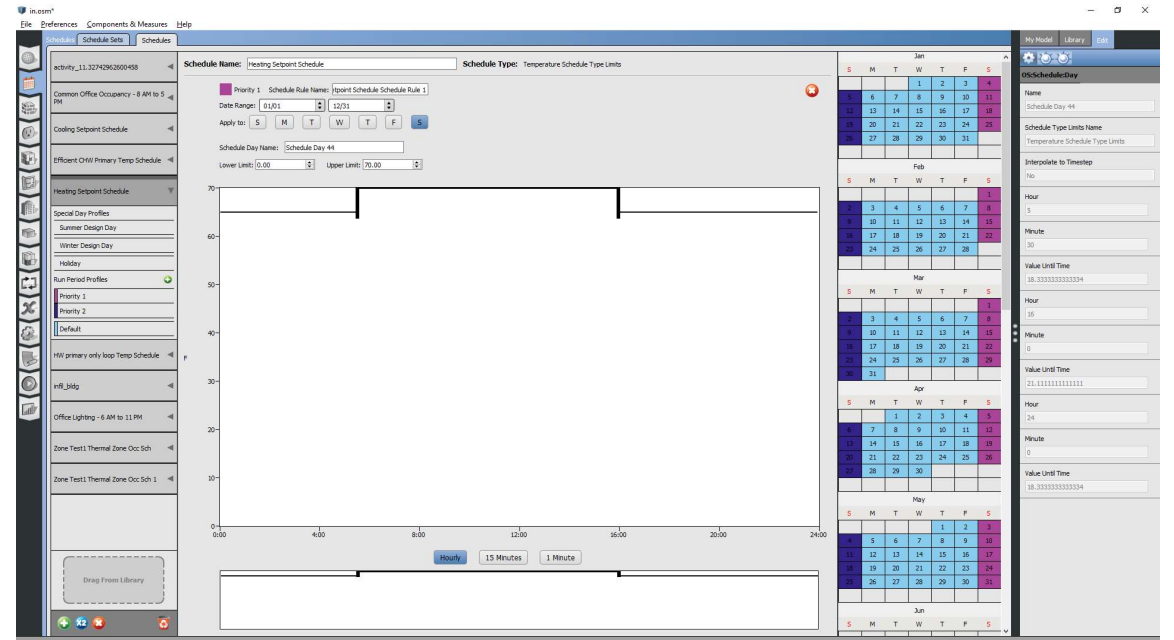
gbXMLStandard_Test_Model_2016.xml

designHeatT = 70.0F

Sat Heating – Before



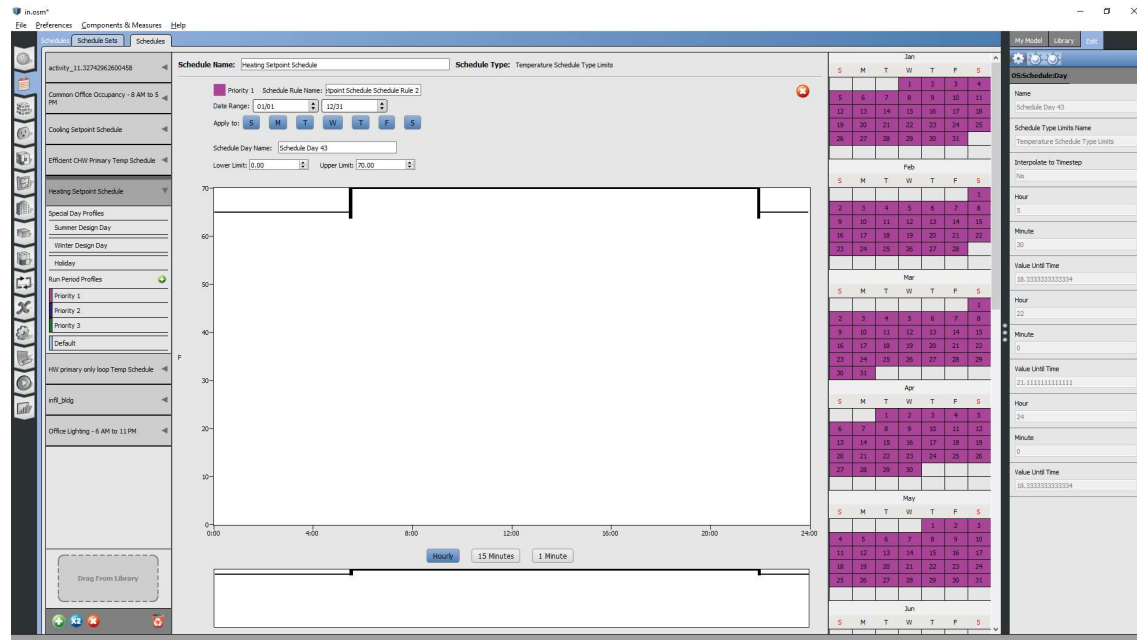
Sat Heating – After



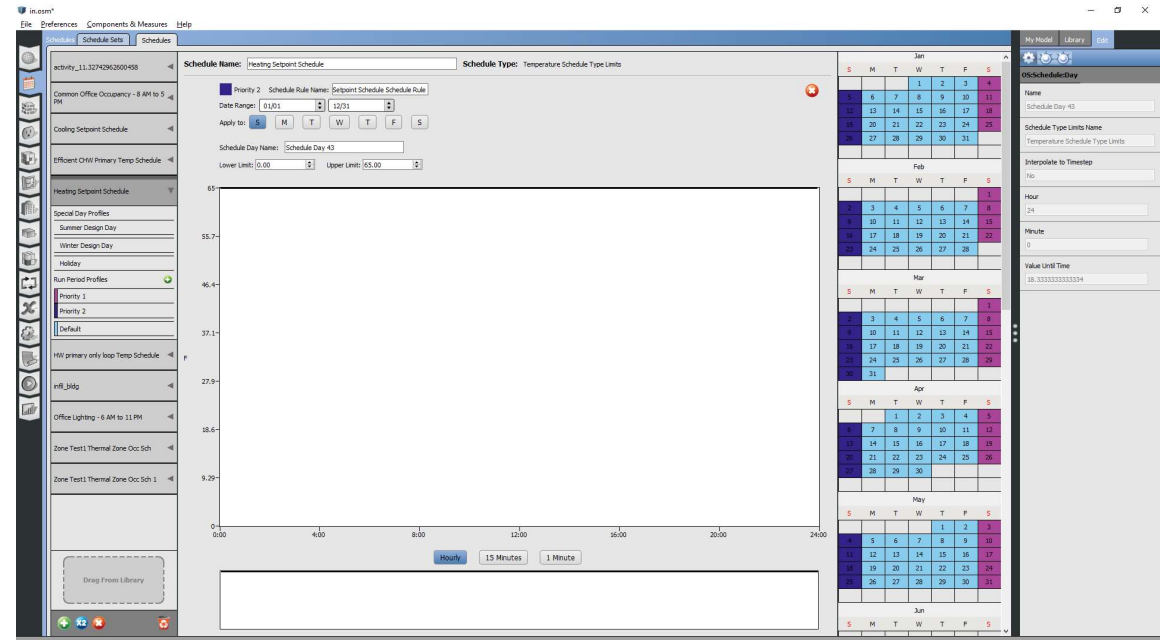
gbXMLStandard_Test_Model_2016.xml

designHeatT = 70.0F

Sun Heating – Before



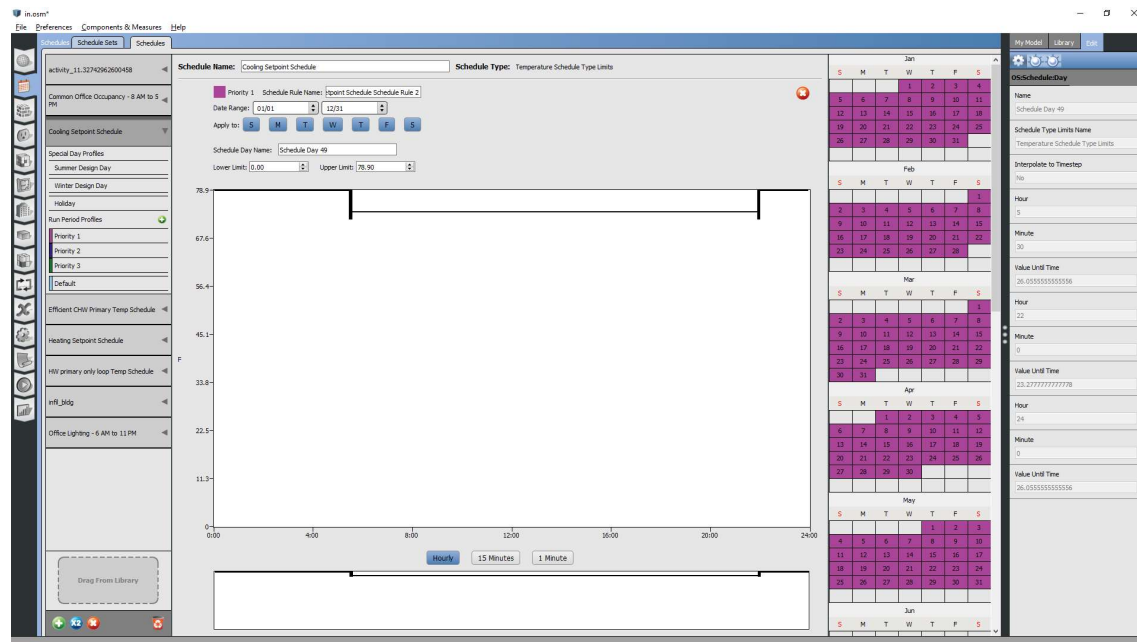
Sun Heating – After



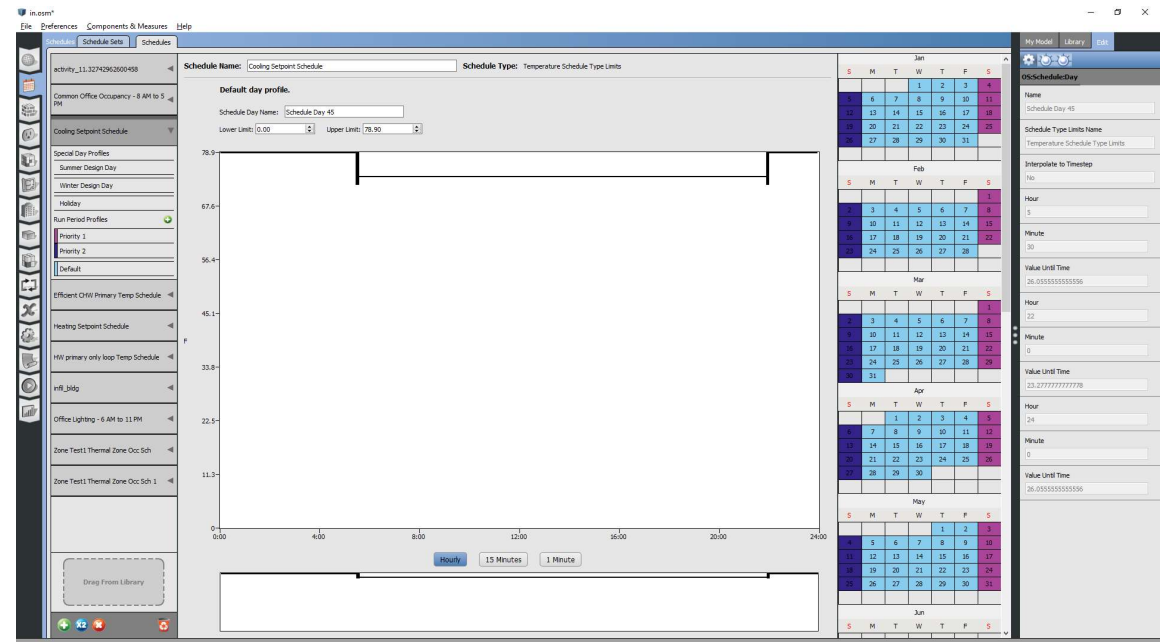
gbXMLStandard_Test_Model_2016.xml

designCoolT = 73.9F

Mon to Fri Cooling – Before



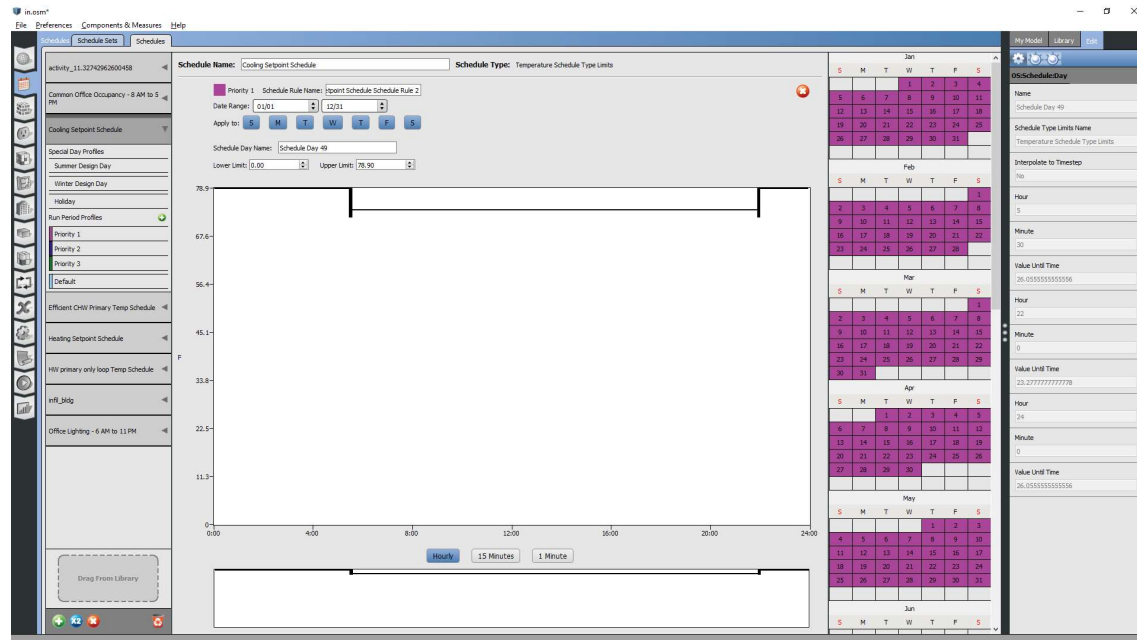
Mon to Fri Cooling – After



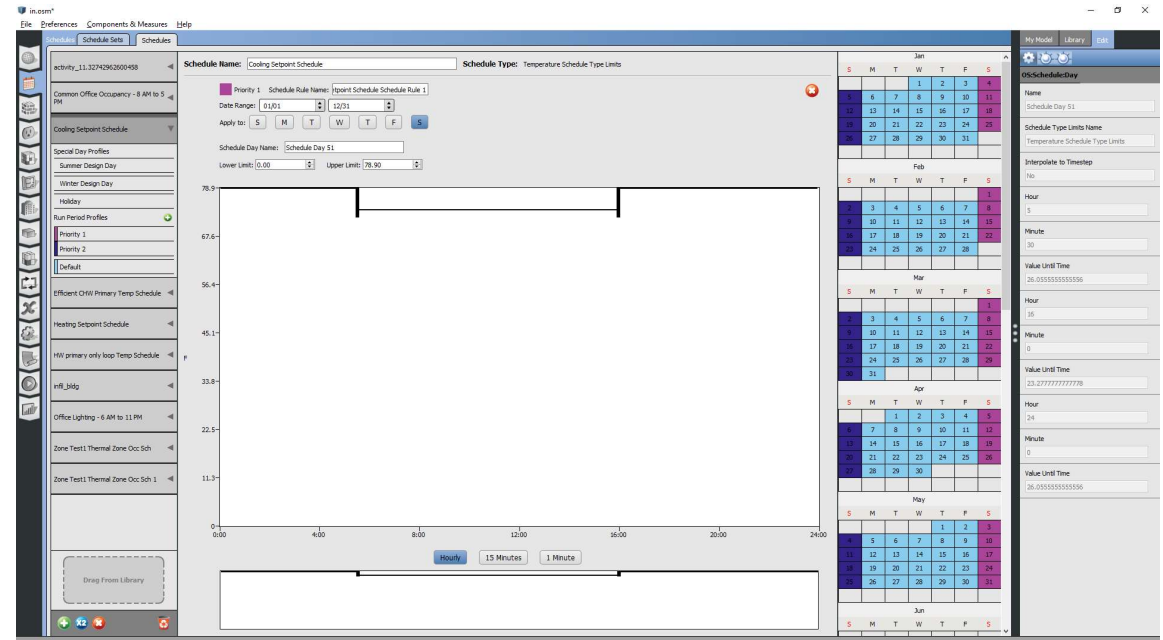
gbXMLStandard_Test_Model_2016.xml

designCoolT = 73.9F

Sat Cooling – Before



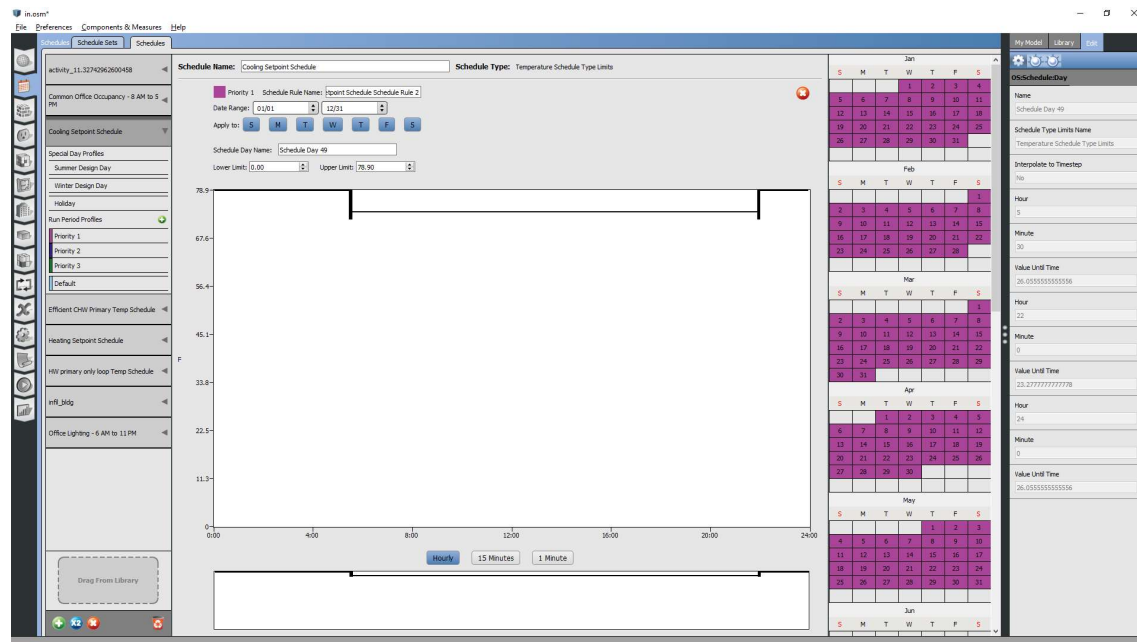
Sat Cooling – After



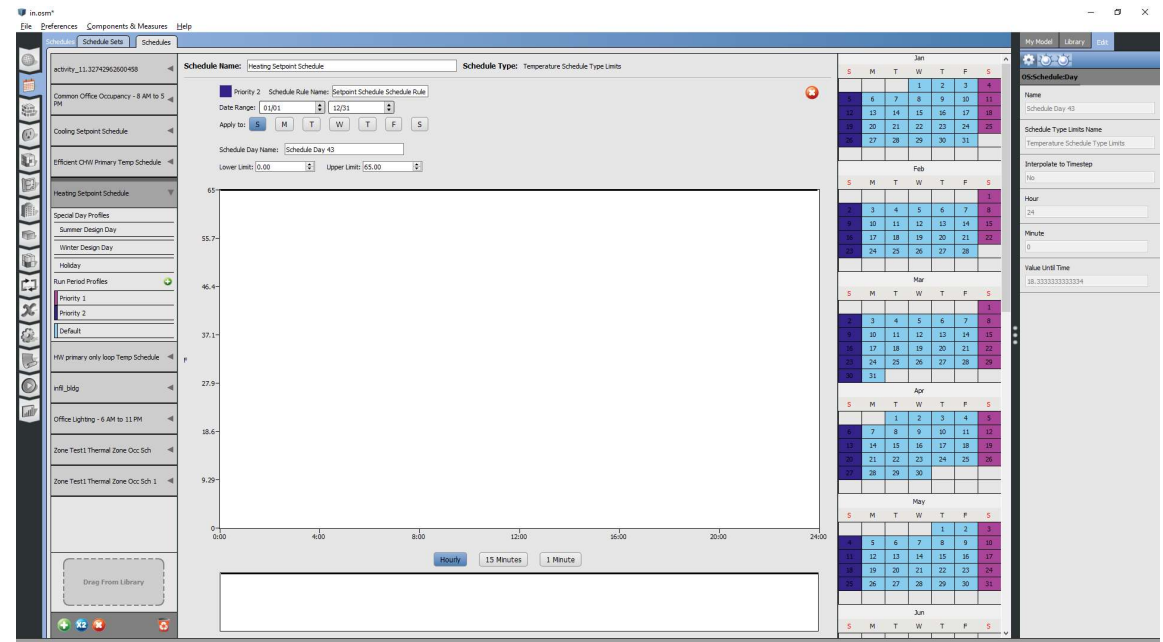
gbXMLStandard_Test_Model_2016.xml

designCoolT = 73.9F

Sun Cooling – Before



Sun Cooling – After

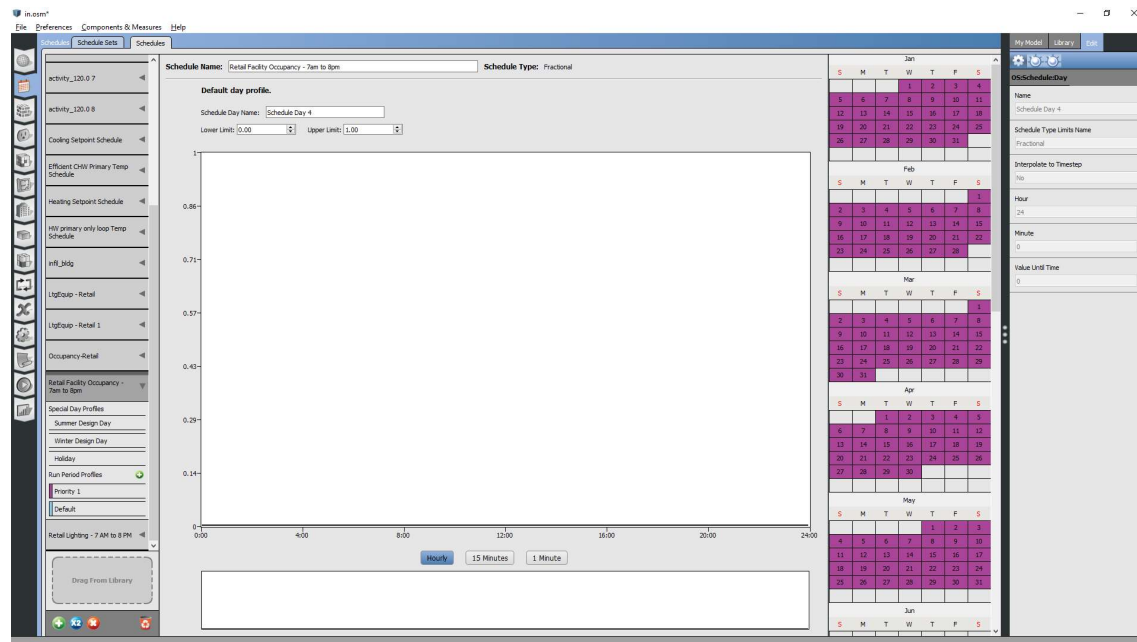


gbXMLStandardv_Retail_Big_Box.xml

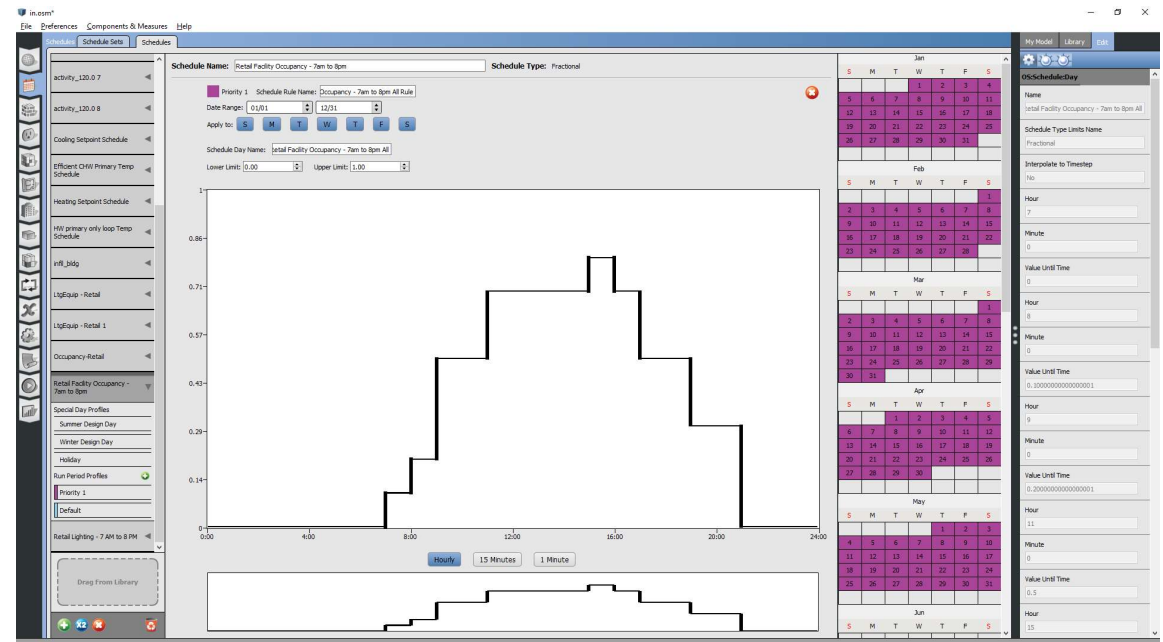
gbXMLStandardv_Retail_Big_Box.xml

Occupancy

Occupancy – Default



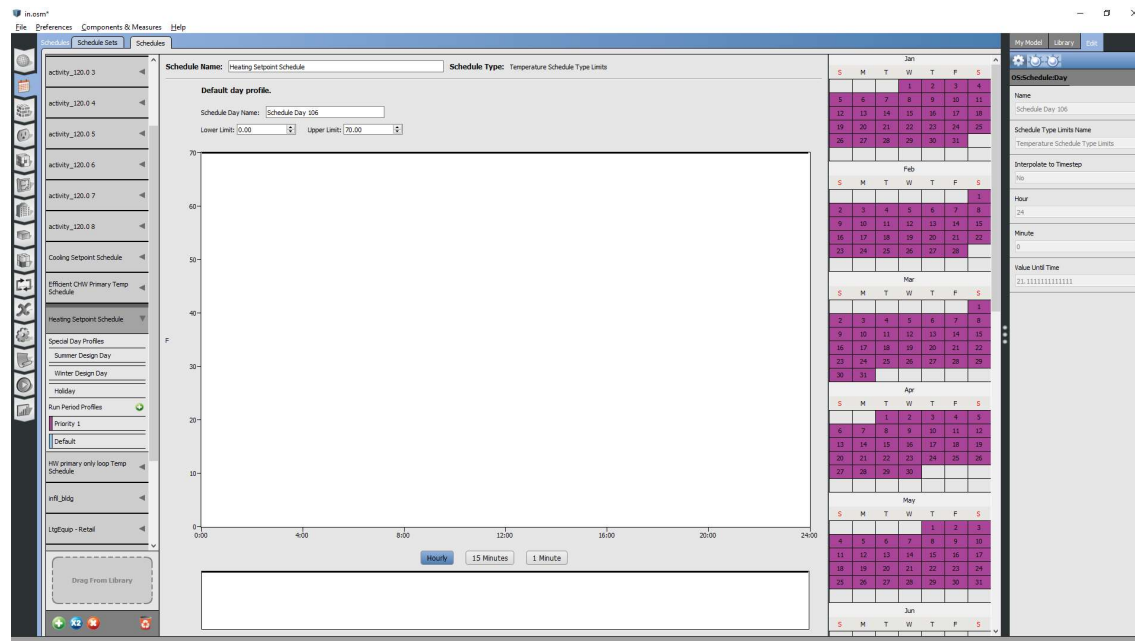
Occupancy – Priority 1



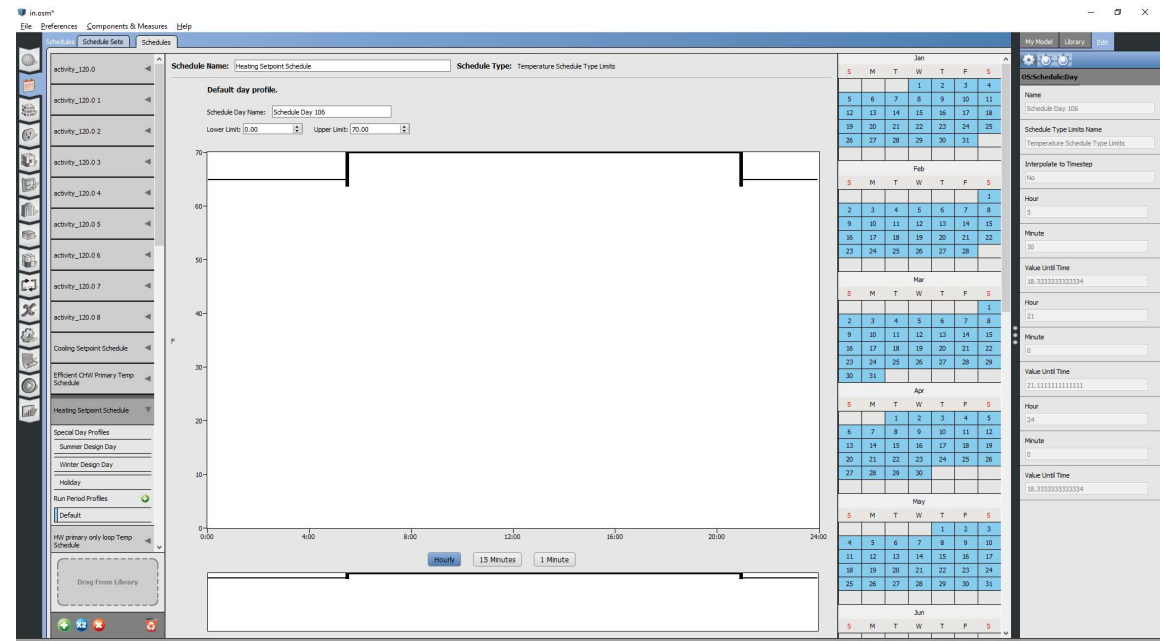
gbXMLStandardv_Retail_Big_Box.xml

designHeatT = 70.0F

Default Heating – Before



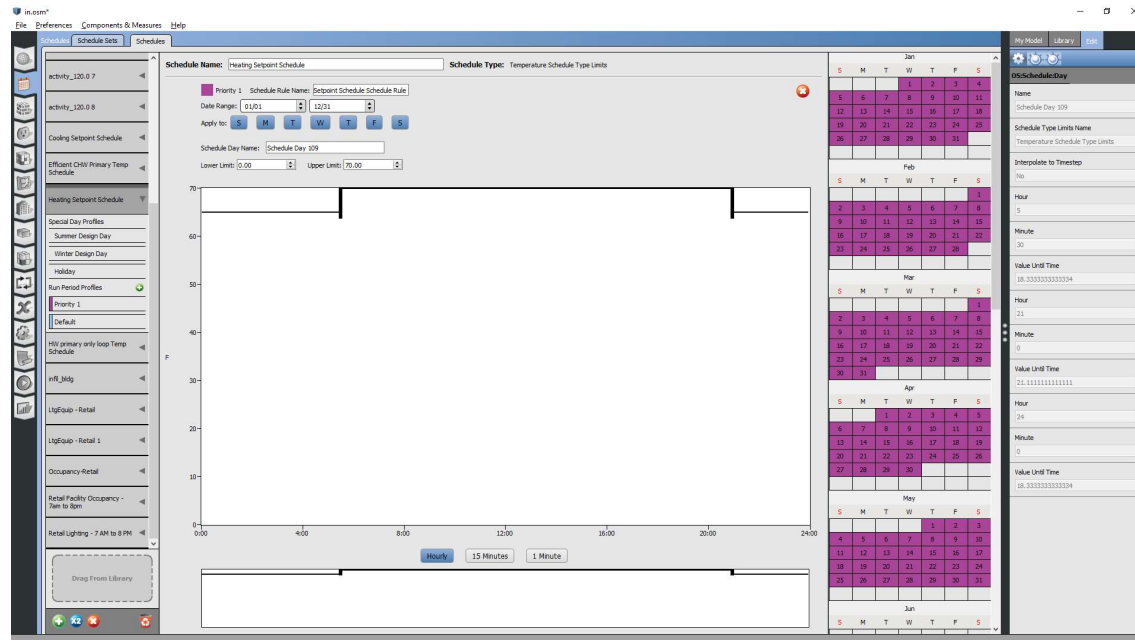
Default Heating – After



gbXMLStandardv_Retail_Big_Box.xml

designHeatT = 70.0F

Priority 1 Heating – Before



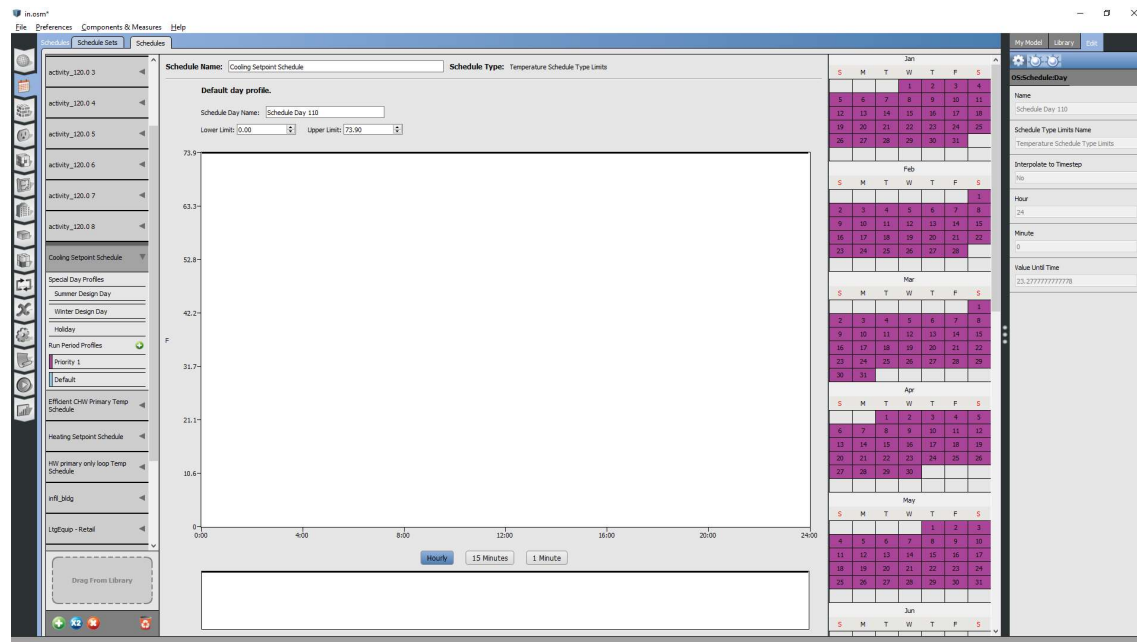
Priority 1 Heating – After

NA

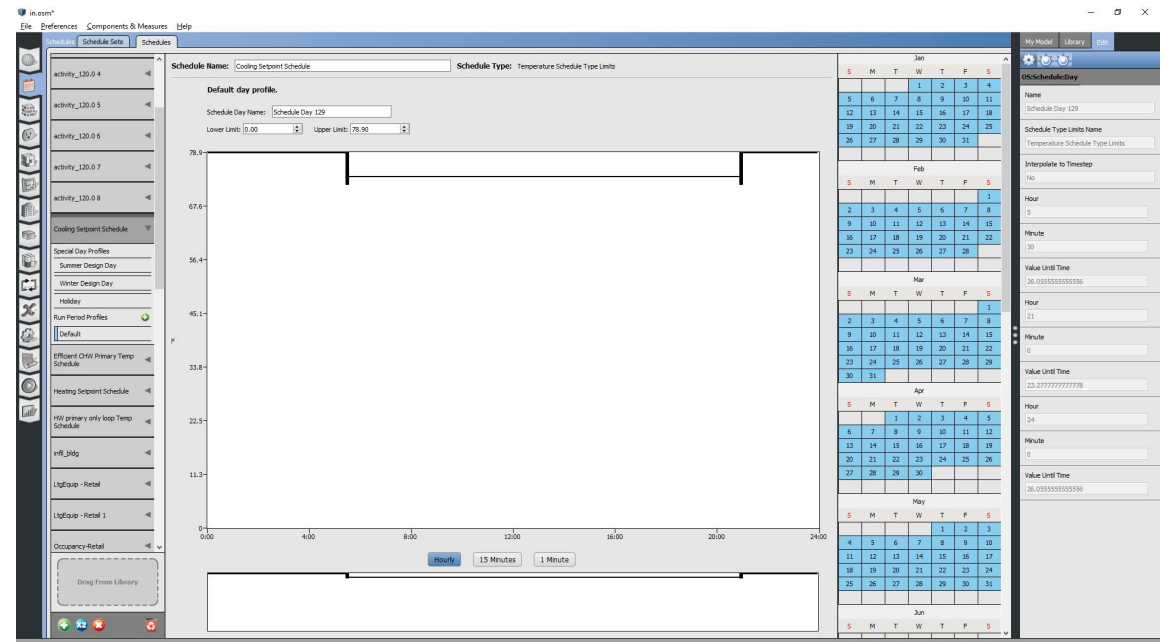
gbXMLStandardv_Retail_Big_Box.xml

designCoolT = 73.9F

Default Cooling – Before



Default Cooling – After

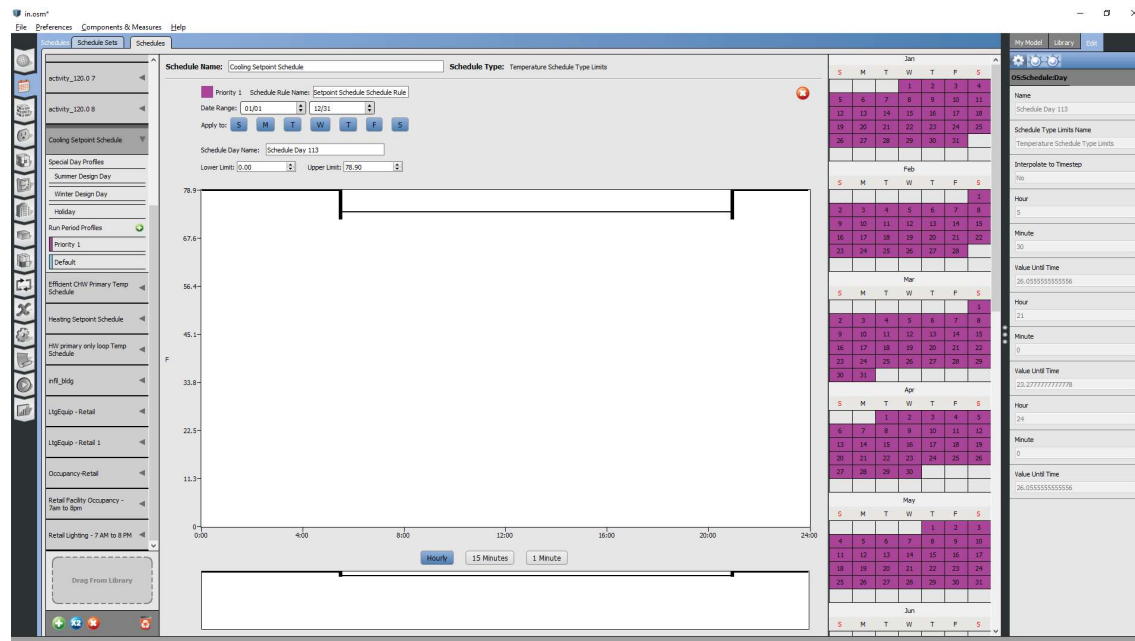


gbXMLStandardv_Retail_Big_Box.xml

designCoolT = 73.9F

Priority 1 Cooling – Before

Priority 1 Cooling – After



NA

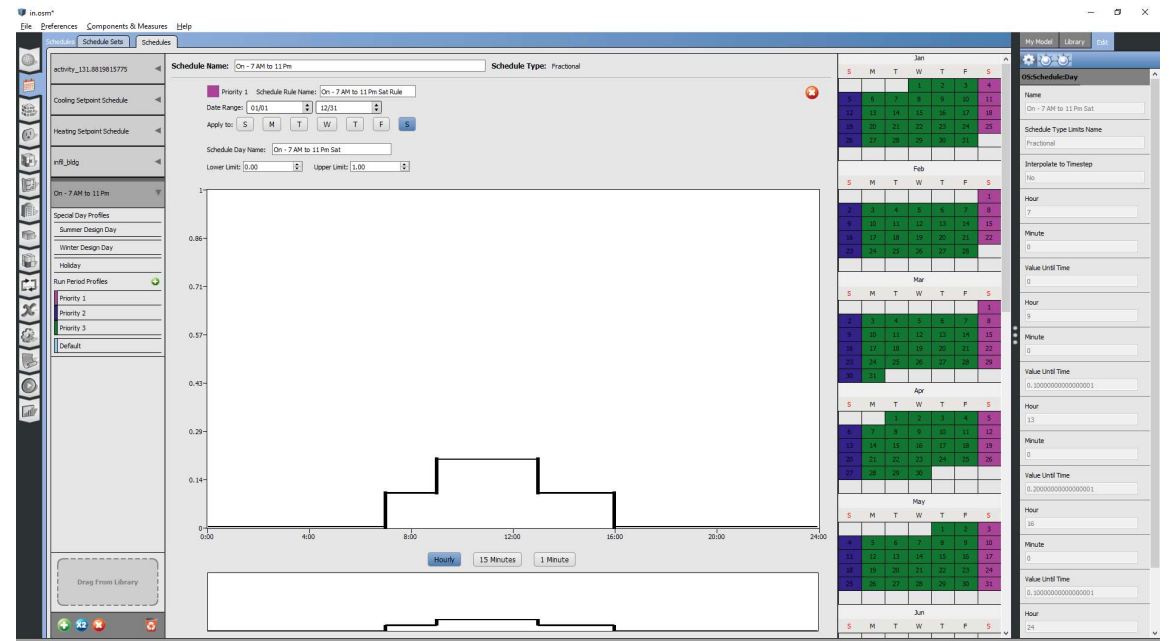
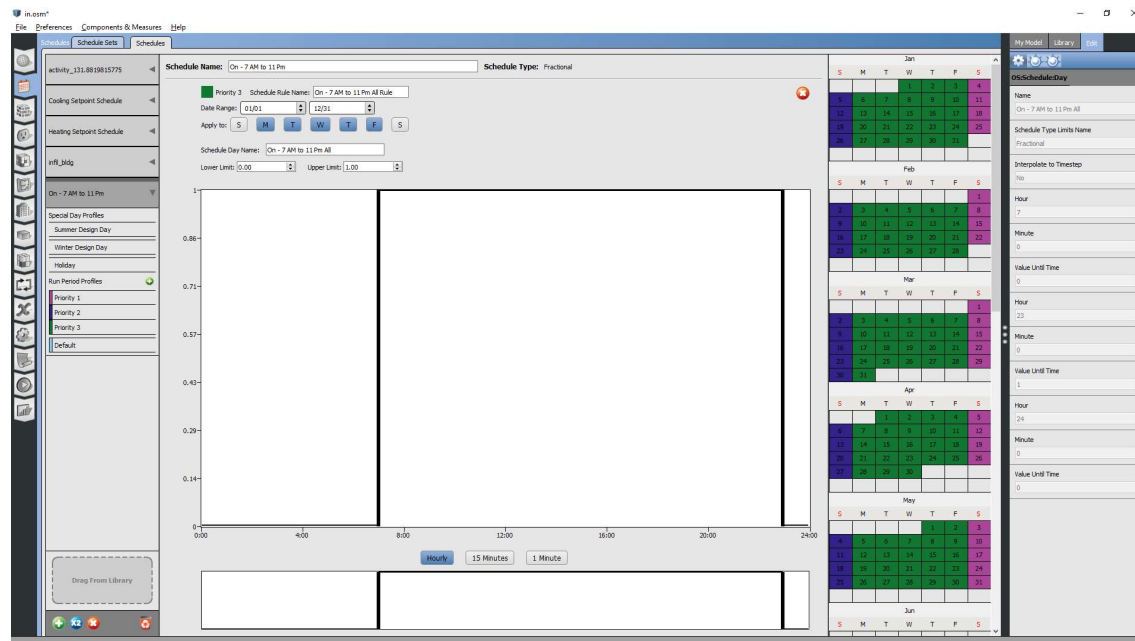
Skyline_B12-Mech_2016-12-21.xml

Skyline_B12-Mech_2016-12-21.xml

Occupancy

Occupancy – **Mon to Fri**

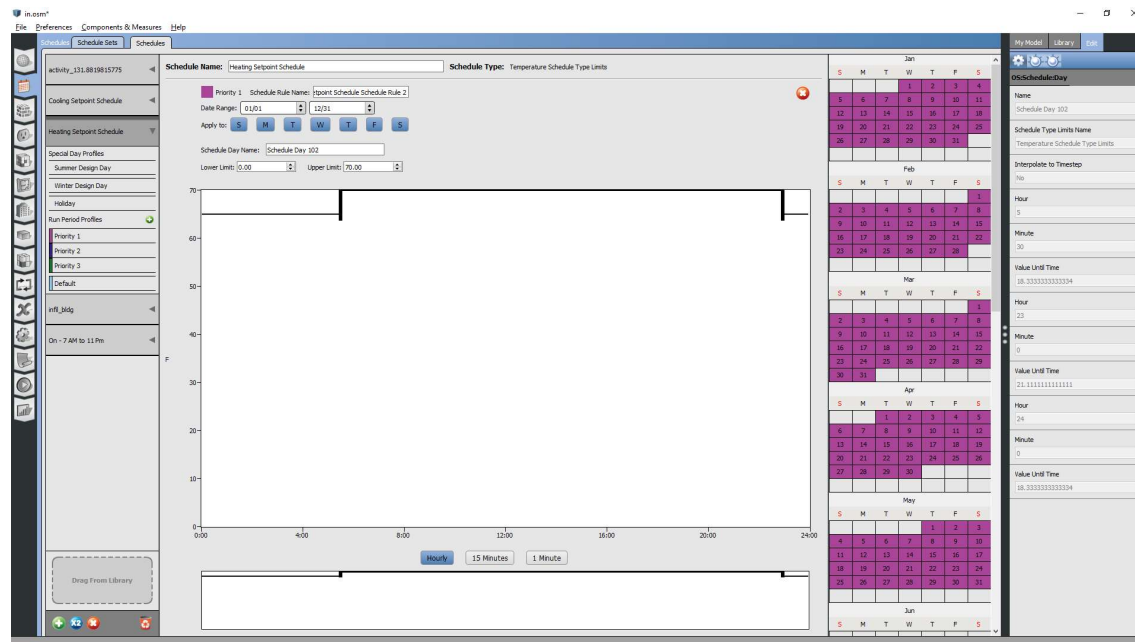
Occupancy – **Sat** (unoccupied **Sun**)



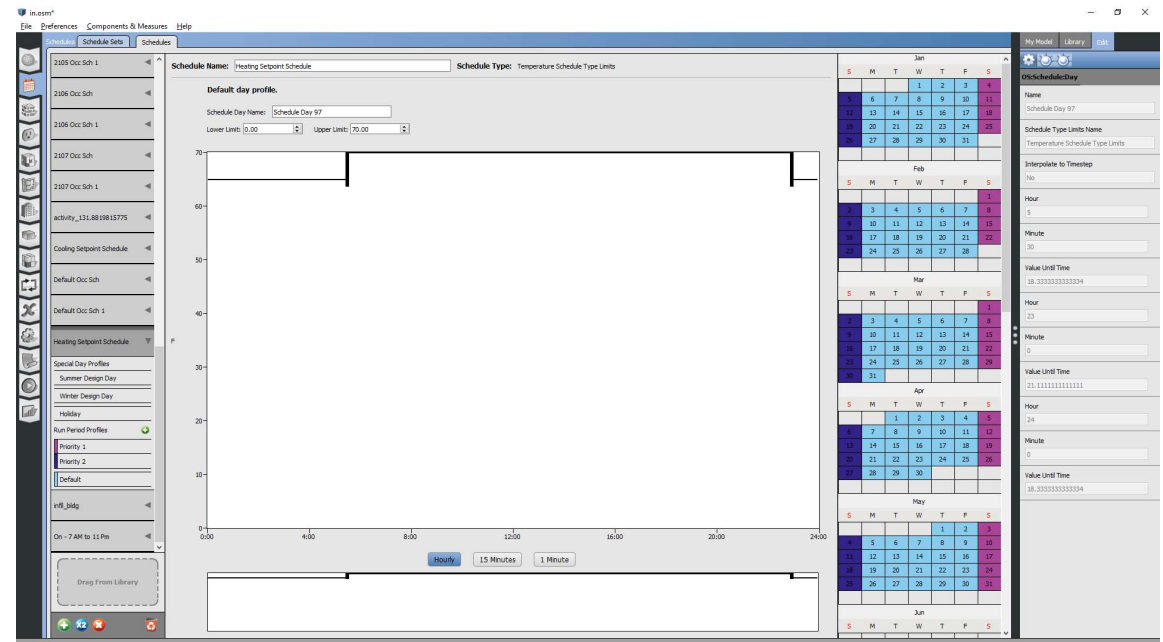
Skyline_B12-Mech_2016-12-21.xml

designHeatT = 70.0F

Mon to Fri Heating – Before



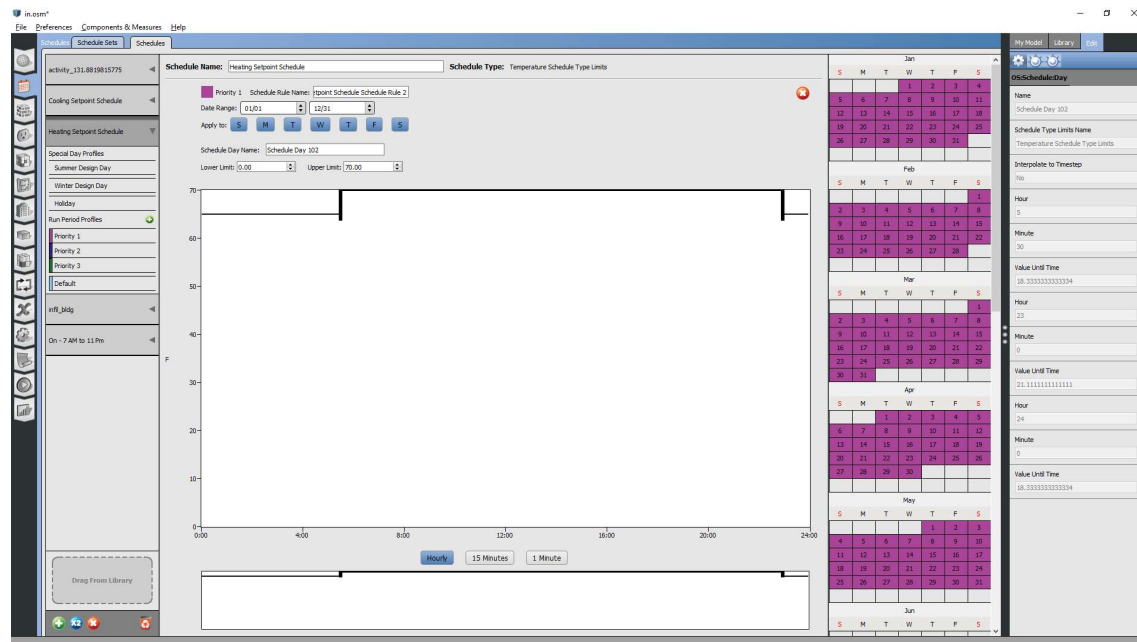
Mon to Fri Heating – After



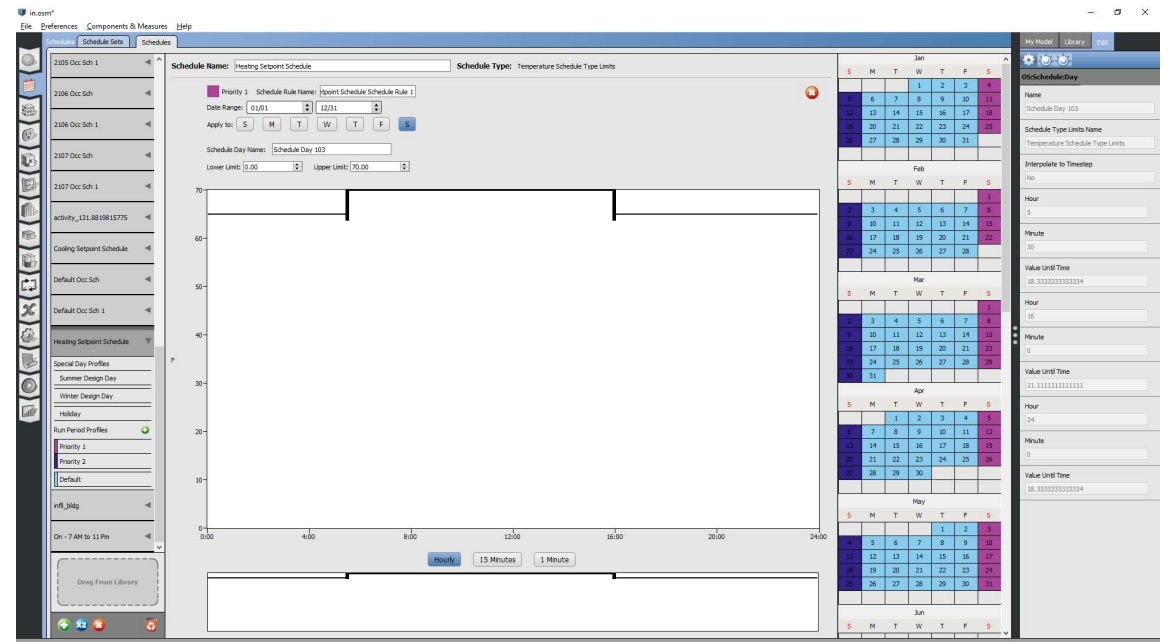
Skyline_B12-Mech_2016-12-21.xml

designHeatT = 70.0F

Sat Heating – Before



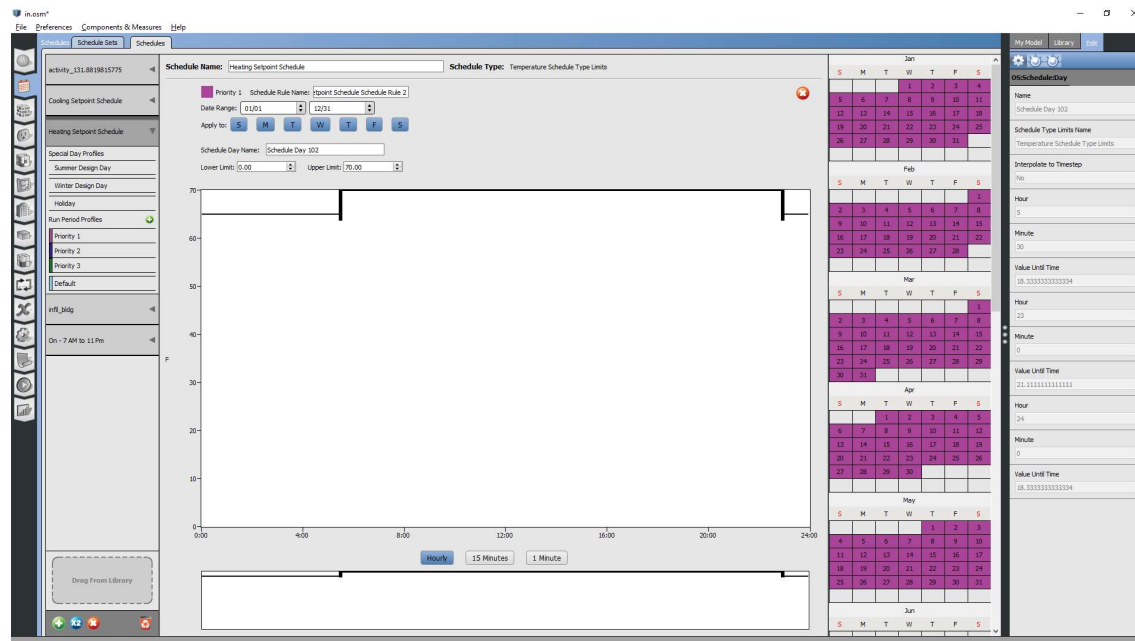
Sat Heating – After



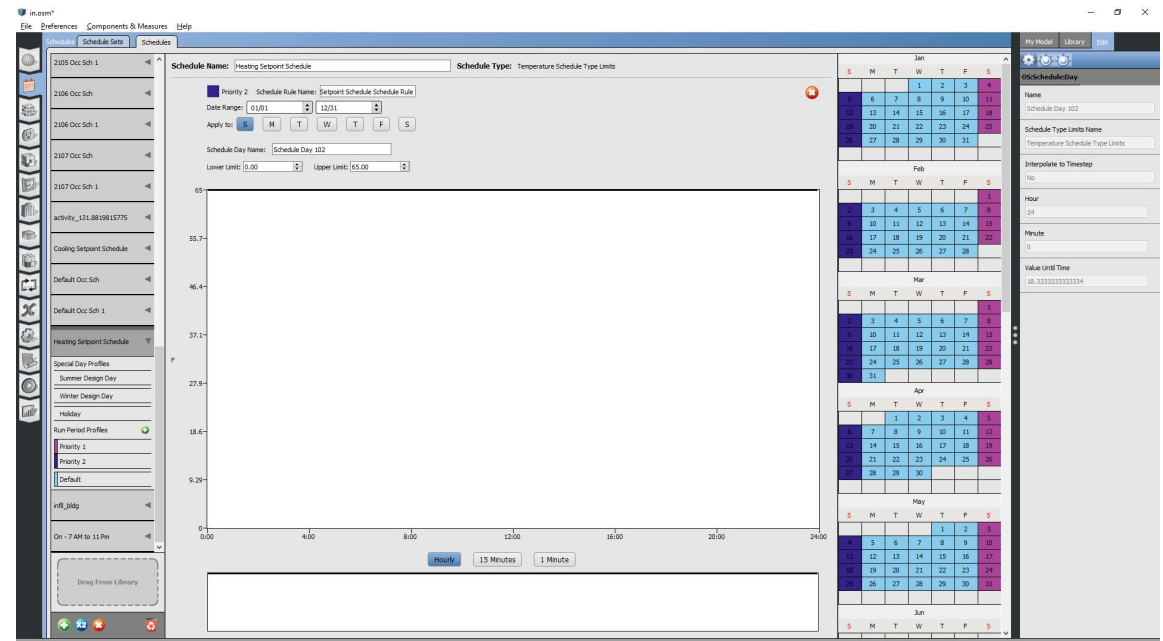
Skyline_B12-Mech_2016-12-21.xml

designHeatT = 70.0F

Sun Heating – Before



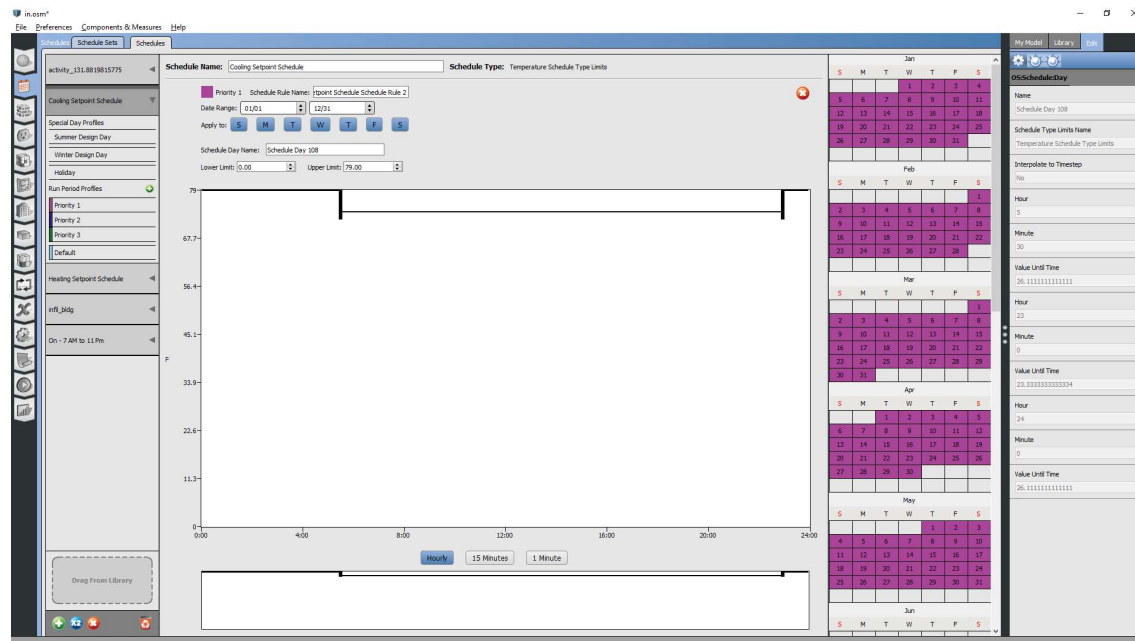
Sun Heating – After



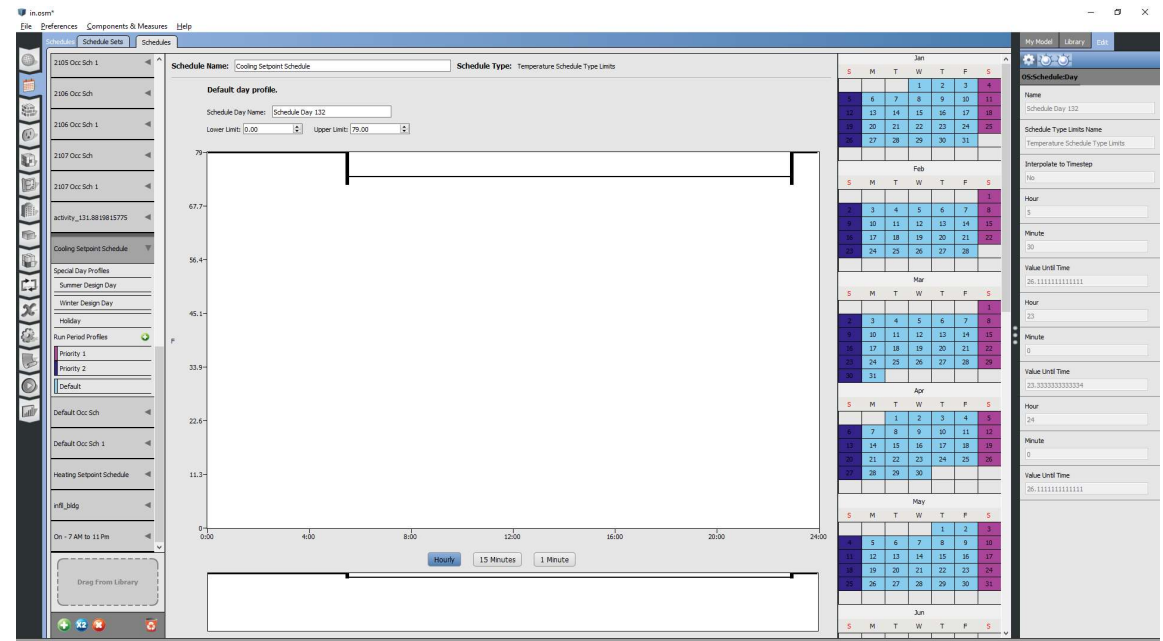
Skyline_B12-Mech_2016-12-21.xml

designCoolT = 74.0F

Mon to Fri Cooling – Before



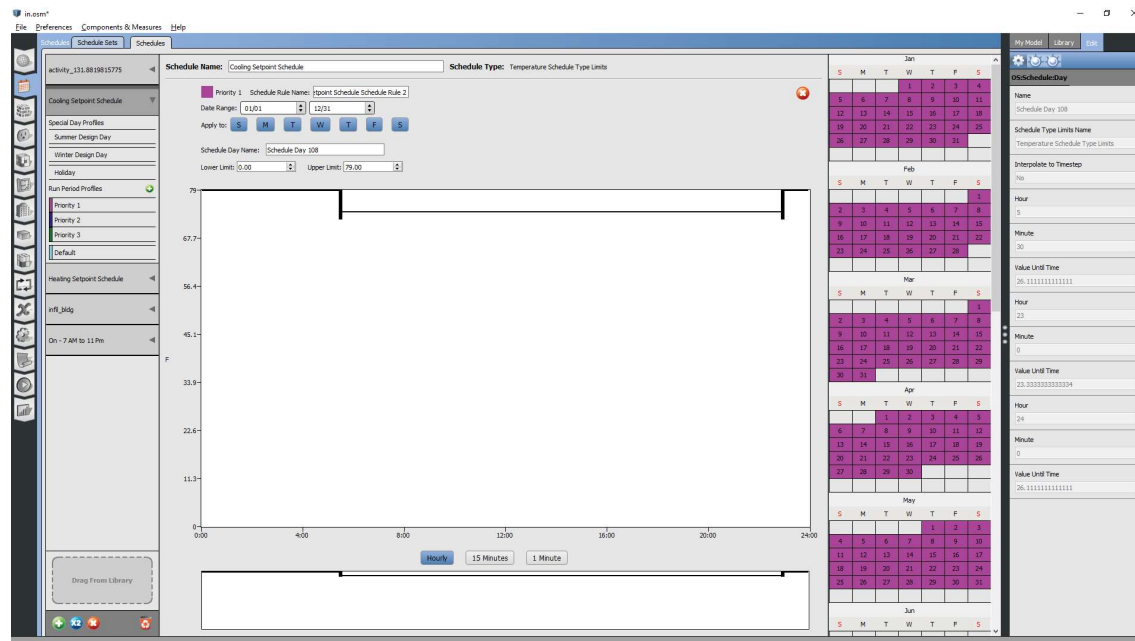
Mon to Fri Cooling – After



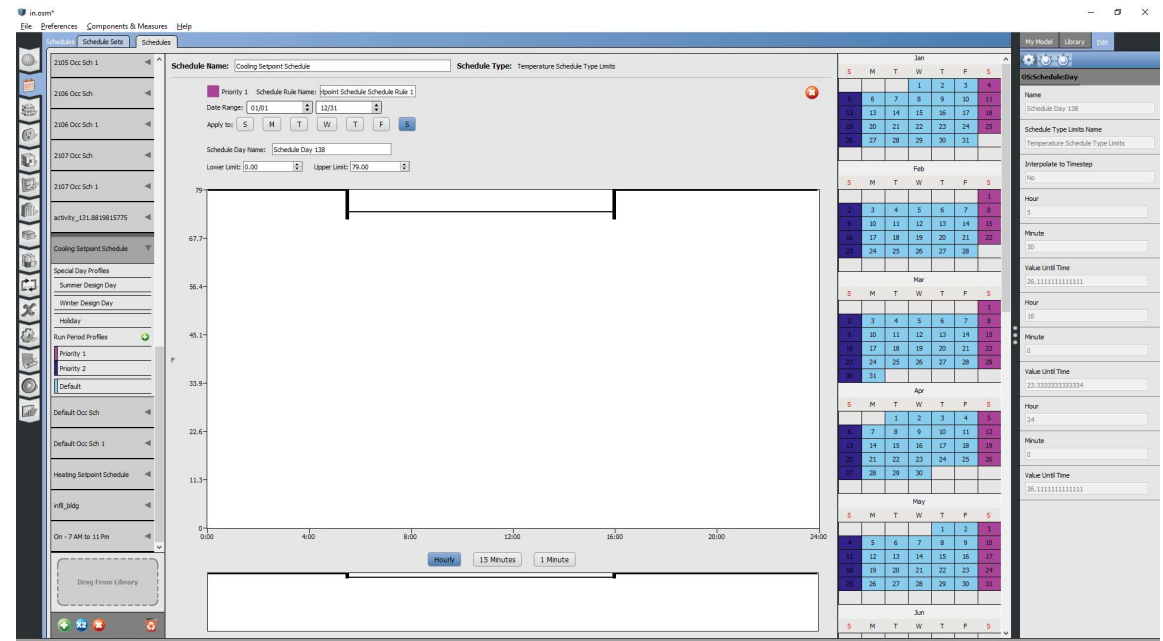
Skyline_B12-Mech_2016-12-21.xml

designCoolT = 74.0F

Sat Heating – Before



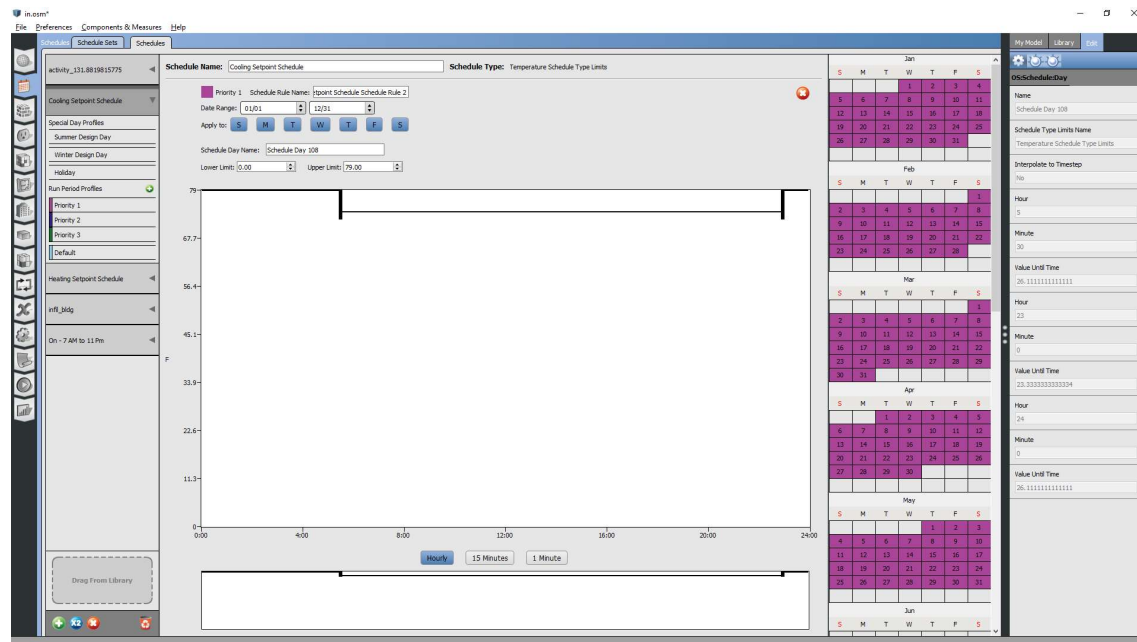
Sat Heating – After



Skyline_B12-Mech_2016-12-21.xml

designCoolT = 74.0F

Sun Cooling – Before



Sun Heating – After

