

## **ATTACHMENT 6**

### **CPS Shift Manager Surveys Regarding ELAP Scenarios**

Condition:

- Unit is in mode 4.
- Division 1 is out of service for a divisional bus outage.
- Division 2 is OPERABLE. RHR-B is in shutdown cooling, and RHR-C is lined up for injection mode.
- HPCS is inoperable and unavailable, but div 3 DG is operable and available.
- Time to boil is approximately 4 hours. Time to TAF is approximately 11 hours.

At time = 0, a simultaneous loss of 138 kV and 345 kV power occurs. Ameren reports that there was a major transformer failure which damaged several breakers in a switchyard common to the 138 kV and 345 kV grids. They are assessing the damage and will report back when they have an estimate for offsite power restoration.

The division 2 DG fails to start. Locally at 1PL12JB, the equipment operator identifies that 5285-3D and 3E are alarming (Failure To Start and Lockout Relay Tripped). ARPs are available if requested. At t = 45 minutes, the local operator identifies that 1DG160 and 1DG161 are SHUT ("A" and "B" air receiver outlet valves). There is no visible damage to the division 2 DG. No work was performed on the division 2 diesel generator. The generator was recently tagged out for a system outage window.

There is no power to the div 1 AC or div 2 AC busses. Div 3 DG starts and loads its bus successfully.

At t = 50 minutes the operator receives a copy of 3506.01P005 to place the DG in standby. He estimates it will be complete by t = 1.5 hours.

- 1) As the shift manager, evaluate 4200.01, Loss of AC Power and 4306.01 Extended Loss of AC Power / Loss of Ultimate Heat Sink and determine which procedures / sections the station is currently in (Station Blackout or ELAP). Explain why.

In Station Blackout but not in ELAP.

Per 4200.01 section 4.4 step 1:

There has been action that provides a High Assurance that Division 2 DG will be restored. This action is the identification that 1DG160 and 1DG161 are shut.

Additionally, 3506.01P005 is estimated for completion of 1.5 hours. This would result in approximately 2.5 hours between the time DG would not start and the time the restoration would be finished. No entry into 4306.01, Extended Loss of AC Power is warranted.

- 2) At time = 50 minutes, the field cannot identify why the division 2 DG did not start. Ameren calls the station and states that offsite power to the 138 kV line can be restored by time = 3 hours via a grid cross tie.

As the shift manager, evaluate 4200.01, Loss of AC Power and 4306.01 Extended Loss of AC Power / Loss of Ultimate Heat Sink and determine which procedures / sections the station is currently in (Station Blackout / ELAP). Explain why.

In Station Blackout but not in ELAP.

Per 4200.01 section 4.4 step 1:

The time requirement for initiating actions of 4306.01, Extended Loss of AC Power / Loss of Ultimate Heat Sink, is to have a Station Blackout without a High Assurance of restoration within 4 hours. Ameren has stated 3 hours to implement the grid cross tie plus the 50 minutes that has already passed. This time is less than the 4-hour requirement.

Since Clinton is conducting a refueling outage there are many persons at my disposal. I would continue investigations for the reasons why the DG did not start which would include, but not limited to:

- Performing 3506.01P005, Placing Division 2 Diesel Generator in Standby
- Have DG knowledgeable personnel from Engineering, Electrical and Mechanical shops to investigate
- Review and stage for 4306.01, Extended Loss of AC Power / Loss of Ultimate Heat Sink.

- 3) At time = 45 minutes, the division 2 DG was returned to standby, however when attempting to start the engine a piston rod cracked through the casing causing substantial damage to the engine. The division 2 DG was emergency stopped by isolating fuel oil from the day tank. At time = 50 minutes, the TSC manager notifies the control room that they have been briefing the division 3 DG cross tie to div 2 bus as a contingency. They estimate that they could complete the cross tie procedure at approximately  $t = 3$  hours.

In Station Blackout but not in ELAP.

Per 4200.01 section 4.4 step 1:

The time requirement for initiating actions of 4306.01, Extended Loss of AC Power / Loss of Ultimate Heat Sink, is to have a Station Blackout without a High Assurance of restoration within 4 hours. TSC has stated 3 hours to implement division 3 DG cross tie to div 2 bus as a contingency plus the 45 minutes that has already passed. No 4306.01 entry is required at this time.

Since Clinton is conducting a refueling outage there are many persons at my disposal. I would continue investigations for the reasons why the DG did not start which would include, but not limited to:

- Performing 3506.01P005, Placing Division 2 Diesel Generator in Standby
- Have DG knowledgeable personnel from Engineering, Electrical and Mechanical shops to investigate
- Review and stage for 4306.01, Extended Loss of AC Power / Loss of Ultimate Heat Sink.

As the shift manager, evaluate 4200.01, Loss of AC Power and 4306.01 Extended Loss of AC Power / Loss of Ultimate Heat Sink and determine which procedures / sections the station is currently in (Station Blackout / ELAP). Explain why. Also, explain if your decision would change if the ERO estimated completion at  $t=4$  hours.

In ELAP but not in Station Blackout.

Per 4200.01 section 4.4 step 1:

The time requirement for initiating actions of 4306.01, Extended Loss of AC Power / Loss of Ultimate Heat Sink, is to have a Station Blackout without a High Assurance of restoration within 4 hours. TSC has stated 4 hours to implement division 3 DG cross tie to div 2 bus plus the 45 minutes that has already passed. Entry into 4306.01 is required at this time.

However, since Clinton is conducting a refueling outage there are many persons at my disposal. I would continue investigations for the reasons why the DG did not start which would include, but not limited to:

- Performing 3506.01P005, Placing Division 2 Diesel Generator in Standby
- Have DG knowledgeable personnel from Engineering, Electrical and Mechanical shops to investigate
- Review and stage for 4306.01, Extended Loss of AC Power / Loss of Ultimate Heat Sink.

- 4) For any of the scenarios above, if an ELAP is not declared, would pre-staging of FLEX per 4306.01 be performed? If so, when would this be initiated? What is your reasoning for pre-staging of FLEX?

Yes, I would commence staging FLEX per 4306.01 as soon as possible but not take priority over actions required per procedure. There are many personnel available since the plant is in an outage. Continuous assessment of the prognosis must be conducted therefore I would implement the Station Blackout and at the same time commence staging for 4306.01 for quick implementation should it be necessary.

Condition:

10/25/18

- Unit is in mode 4.
- Division 1 is out of service for a divisional bus outage.
- Division 2 is OPERABLE. RHR-B is in shutdown cooling, and RHR-C is lined up for injection mode.
- HPCS is inoperable and unavailable, but div 3 DG is operable and available.
- Time to boil is approximately 4 hours. Time to TAF is approximately 11 hours.

At time = 0, a simultaneous loss of 138 kV and 345 kV power occurs. Ameren reports that there was a major transformer failure which damaged several breakers in a switchyard common to the 138 kV and 345 kV grids. They are assessing the damage and will report back when they have an estimate for offsite power restoration.

The division 2 DG fails to start. Locally at 1PL12JB, the equipment operator identifies that 5285-3D and 3E are alarming (Failure To Start and Lockout Relay Tripped). ARPs are available if requested. At t = 45 minutes, the local operator identifies that 1DG160 and 1DG161 are SHUT ("A" and "B" air receiver outlet valves). There is no visible damage to the division 2 DG. No work was performed on the division 2 diesel generator. The generator was recently tagged out for a system outage window.

There is no power to the div 1 AC or div 2 AC busses. Div 3 DG starts and loads its bus successfully.

At t = 50 minutes the operator receives a copy of 3506.01P005 to place the DG in standby. He estimates it will be complete by t = 1.5 hours.

- 1) As the shift manager, evaluate 4200.01, Loss of AC Power and 4306.01 Extended Loss of AC Power / Loss of Ultimate Heat Sink and determine which procedures / sections the station is currently in (Station Blackout or ELAP). Explain why.
  - When the DG fails to start on the loss of offsite power, the crew will enter 4200.01, loss of AC off normal. The crew will recognize that DIV 1 DG was already out of service and DIV 2 DG failed to start and recognize this as a station blackout. Operators will be immediately dispatched to the DIV 2 DG to investigate the failure to start. Since we are in an outage I will have an OWEC supervisor respond to the DIV 2 DG as well. The crew will review 4200.01 including steps 1.4 and 1.5. Again, the CRS will recognize this as a station blackout (an update would have been made in the MCR). The Loss of AC off normal is normally handed off to an RO to drive through the procedure. Whoever is the licensed operator responsible for 4200.01 will inform the SM to evaluate this condition for an ELAP. As the SM I am providing oversight for the entire process in the MCR and with the communication from the RO, I will review the details of an ELAP as described in 4200.01 and 4306.01. When I am finished with the review of the requirements, I will announce an update to the MCR team stating that I need to know the status of the DIV 2 DG and if it is recoverable and how much time it will take to recover by T=60. This will be assigned as a critical parameter. At T=45, when the area operator reports that 1DG160 and 1DG161 are SHUT ("A" and "B" air receiver outlet valves) and there is no visible damage to the division 2 DG, I will direct that the DG air system be restored immediately (by procedure) (If the order has not already been

provided). At T=50, When the area operator performing 3506.01P005 and the supervisor informs the MCR that it will 1.5 hours to restore, I will declare that an ELAP does not exist. The crew will continue with the actions in 4200.01 for a station black out while the SM continues to monitor progress to restore DIV 2 DG and continue to assess progress and evaluate ELAP.

At T=15 as the SM, I declare EAL CA1 and staffs the ERO. The ERO is required to be fully staffed by T=75 (60 minutes from declaration). The number 1 priority for the ERO will be communicated as restoration of DIV 2 DG. I will coordinate with the Station Emergency Director and the Operations Manager to request the number 2 priority be briefing and staging equipment to support ELAP if an ELAP is declared and the number 3 priority is evaluate restoration of offsite sources, DIV 1 systems to support DIV 1 DG or cross tie DIV 3 DG to DIV 2 AC. Prestaging equipment for ELAP is allowed by 4306.01 block below the entry condition with a note to the right stating "OK to pre-stage equipment".

- 2) At time = 50 minutes, the field cannot identify why the division 2 DG did not start. Ameren calls the station and states that offsite power to the 138 kV line can be restored by time = 3 hours via a grid cross tie.

As the shift manager, evaluate 4200.01, Loss of AC Power and 4306.01 Extended Loss of AC Power / Loss of Ultimate Heat Sink and determine which procedures / sections the station is currently in (Station Blackout / ELAP). Explain why.

This is the same as described above. Since it was determined prior to the one-hour point (T=50) that a source of power to a DIV 1 or DIV 2 bus can be restored within 4 hours, an ELAP is not declared, the actions in 4200.01 for station blackout are continued, the ERO is staffed and the briefing and pre-staging activities continue.

- 3) At time = 45 minutes, the division 2 DG was returned to standby, however when attempting to start the engine a piston rod cracked through the casing causing substantial damage to the engine. The division 2 DG was emergency stopped by isolating fuel oil from the day tank. At time = 50 minutes , the TSC manager notifies the control room that they have been briefing the division 3 DG cross tie to div 2 bus as a contingency. They estimate that they could complete the cross tie procedure at approximately t = 3 hours.

As the shift manager, evaluate 4200.01, Loss of AC Power and 4306.01 Extended Loss of AC Power / Loss of Ultimate Heat Sink and determine which procedures / sections the station is currently in (Station Blackout / ELAP). Explain why. Also, explain if your decision would change if the ERO estimated completion at t=4 hours.

This is the same as described above. Since it was determined prior to the one-hour point (T=50) that a source of power to a DIV 1 or DIV 2 bus can be restored within 4 hours (T=3), an ELAP is not declared, the actions in 4200.01 for station blackout are continued, the ERO is staffed and the briefing and pre-staging activities continue.

For part 2, if T=4, As the SM, I would have further consultation with the TSC manager on the time to T-4 to fully understand what is the true timeline and if he can convince me that this action can be taken in under 4 hours. If it can be, an ELAP is not declared and I will be focused on the progress to ensure there are no delays in the estimated timeline to T=4 to restore power. If it cannot be assured or at any time there is a delay, and the 4 hour time is jeopardized, I would stop the station blackout actions and enter the ELAP.

- 4) For any of the scenarios above, if an ELAP is not declared, would pre-staging of FLEX per 4306.01 be performed? If so, when would this be initiated? What is your reasoning for pre-staging of FLEX?

This is explained above.

Condition:

- Unit is in mode 4.
- Division 1 is out of service for a divisional bus outage.
- Division 2 is OPERABLE. RHR-B is in shutdown cooling, and RHR-C is lined up for injection mode.
- HPCS is inoperable and unavailable, but div 3 DG is operable and available.
- Time to boil is approximately 4 hours. Time to TAF is approximately 11 hours.

At time = 0, a simultaneous loss of 138 kV and 345 kV power occurs. Ameren reports that there was a major transformer failure which damaged several breakers in a switchyard common to the 138 kV and 345 kV grids. They are assessing the damage and will report back when they have an estimate for offsite power restoration.

The division 2 DG fails to start. Locally at 1PL12JB, the equipment operator identifies that 5285-3D and 3E are alarming (Failure To Start and Lockout Relay Tripped). ARPs are available if requested. At t = 45 minutes, the local operator identifies that 1DG160 and 1DG161 are SHUT ("A" and "B" air receiver outlet valves). There is no visible damage to the division 2 DG. No work was performed on the division 2 diesel generator. The generator was recently tagged out for a system outage window.

There is no power to the div 1 AC or div 2 AC busses. Div 3 DG starts and loads its bus successfully.

At t = 50 minutes the operator receives a copy of 3506.01P005 to place the DG in standby. He estimates it will be complete by t = 1.5 hours.

- 1) As the shift manager, evaluate 4200.01, Loss of AC Power and 4306.01 Extended Loss of AC Power / Loss of Ultimate Heat Sink and determine which procedures / sections the station is currently in (Station Blackout or ELAP). Explain why.

4200.01 - Currently in section 4.4 Station Blackout

due to loss of both offsite AC power sources, and a loss of div 1 + 2 DGs

At t = 45 operator identified 1DG160 / 1DG161 shut

At t = 50 Action being taken to restore div 2 DG

Continue to monitor SBO recovery actions and if not successful, then Execute 4306.01

- 2) At time = 50 minutes, the field cannot identify why the division 2 DG did not start. Ameren calls the station and states that offsite power to the 138 kV line can be restored by time = 3 hours via a grid cross tie.

As the shift manager, evaluate 4200.01, Loss of AC Power and 4306.01 Extended Loss of AC Power / Loss of Ultimate Heat Sink and determine which procedures / sections the station is currently in (Station Blackout / ELAP). Explain why.

4200.01 - Currently in section 4.4 Station Blackout

Power to be restored in < 4 hrs

Continue to monitor SBO recovery actions and if not successful, then Execute 4306.01

Condition:

- Unit is in mode 4.
- Division 1 is out of service for a divisional bus outage.
- Division 2 is OPERABLE. RHR-B is in shutdown cooling, and RHR-C is lined up for injection mode.
- HPCS is inoperable and unavailable, but div 3 DG is operable and available.
- Time to boil is approximately 4 hours. Time to TAF is approximately 11 hours.

At time = 0, a simultaneous loss of 138 kV and 345 kV power occurs. Ameren reports that there was a major transformer failure which damaged several breakers in a switchyard common to the 138 kV and 345 kV grids. They are assessing the damage and will report back when they have an estimate for offsite power restoration.

The division 2 DG fails to start. Locally at 1PL12JB, the equipment operator identifies that 5285-3D and 3E are alarming (Failure To Start and Lockout Relay Tripped). ARPs are available if requested. At t = 45 minutes, the local operator identifies that 1DG160 and 1DG161 are SHUT ("A" and "B" air receiver outlet valves). There is no visible damage to the division 2 DG. No work was performed on the division 2 diesel generator. The generator was recently tagged out for a system outage window.

There is no power to the div 1 AC or div 2 AC busses. Div 3 DG starts and loads its bus successfully.

At t = 50 minutes the operator receives a copy of 3506.01P005 to place the DG in standby. He estimates it will be complete by t = 1.5 hours.

- 1) As the shift manager, evaluate 4200.01, Loss of AC Power and 4306.01 Extended Loss of AC Power / Loss of Ultimate Heat Sink and determine which procedures / sections the station is currently in (Station Blackout or ELAP). Explain why.

*This would be SBO section due to having high assurance of power restored within 4 hours*

- 2) At time = 50 minutes, the field cannot identify why the division 2 DG did not start. Ameren calls the station and states that offsite power to the 138 kV line can be restored by time = 3 hours via a grid cross tie.

As the shift manager, evaluate 4200.01, Loss of AC Power and 4306.01 Extended Loss of AC Power / Loss of Ultimate Heat Sink and determine which procedures / sections the station is currently in (Station Blackout / ELAP). Explain why.

*This would also be SBO based on previous justification.*

Condition:

- Unit is in mode 4.
- Division 1 is out of service for a divisional bus outage.
- Division 2 is OPERABLE. RHR-B is in shutdown cooling, and RHR-C is lined up for injection mode.
- HPCS is inoperable and unavailable, but div 3 DG is operable and available.
- Time to boil is approximately 4 hours. Time to TAF is approximately 11 hours.

At time = 0, a simultaneous loss of 138 kV and 345 kV power occurs. Ameren reports that there was a major transformer failure which damaged several breakers in a switchyard common to the 138 kV and 345 kV grids. They are assessing the damage and will report back when they have an estimate for offsite power restoration.

The division 2 DG fails to start. Locally at 1PL12JB, the equipment operator identifies that 5285-3D and 3E are alarming (Failure To Start and Lockout Relay Tripped). ARPs are included below. At t = 45 minutes, the local operator identifies that 1DG160 and 1DG161 are SHUT ("A" and "B" air receiver outlet valves). There is no visible damage to the division 2 DG.

There is no power to the div 1 AC or div 2 AC busses. Div 3 DG starts and loads its bus successfully.

At t = 50 minutes the operator receives a copy of 3506.01P005 to place the DG in standby. He estimates it will be complete by t = 1.5 hours.

- 1) As the shift manager, evaluate 4200.01, Loss of AC Power and 4306.01 Extended Loss of AC Power / Loss of Ultimate Heat Sink and determine which procedures / sections the station is currently in (Station Blackout or ELAP). Explain why.

4200.01 states determine ELAP w/in 1 hour. ELAP as defined in discussion is > 4 hours. Estimated time to fix is < 4 hours so Not in ELAP

- 2) At time = 50 minutes, the field cannot identify why the division 2 DG did not start. Ameren calls the station and states that offsite power to the 138 kV line can be restored by time = 3 hours via a grid cross tie.

As the shift manager, evaluate 4200.01, Loss of AC Power and 4306.01 Extended Loss of AC Power / Loss of Ultimate Heat Sink and determine which procedures / sections the station is currently in (Station Blackout or ELAP). Explain why.

< 4 estimate time of Restoration

Condition:

- Unit is in mode 4.
- Division 1 is out of service for a divisional bus outage.
- Division 2 is OPERABLE. RHR-B is in shutdown cooling, and RHR-C is lined up for injection mode.
- HPCS is inoperable and unavailable, but div 3 DG is operable and available.
- Time to boil is approximately 4 hours. Time to TAF is approximately 11 hours.

At time = 0, a simultaneous loss of 138 kV and 345 kV power occurs. Ameren reports that there was a major transformer failure which damaged several breakers in a switchyard common to the 138 kV and 345 kV grids. They are assessing the damage and will report back when they have an estimate for offsite power restoration.

The division 2 DG fails to start. Locally at 1PL12JB, the equipment operator identifies that 5285-3D and 3E are alarming (Failure To Start and Lockout Relay Tripped). ARPs are available if requested. At t = 45 minutes, the local operator identifies that 1DG160 and 1DG161 are SHUT ("A" and "B" air receiver outlet valves). There is no visible damage to the division 2 DG. No work was performed on the division 2 diesel generator. The generator was recently tagged out for a system outage window.

There is no power to the div 1 AC or div 2 AC busses. Div 3 DG starts and loads its bus successfully.

At t = 50 minutes the operator receives a copy of 3506.01P005 to place the DG in standby. He estimates it will be complete by t = 1.5 hours.

- 1) As the shift manager, evaluate 4200.01, Loss of AC Power and 4306.01 Extended Loss of AC Power / Loss of Ultimate Heat Sink and determine which procedures / sections the station is currently in (Station Blackout or ELAP). Explain why.

*4200.01 section 4.4, SBO and you have the entry condition for 4306.01, but cannot go further until an ELAP is assessed.*

*Within 1 hour action has been taken to provide a HIGH ASSURANCE of restoration of Div 1 and/or Div 2 power within the 4hr coping period.*

*Given that within 1hr we were able to assess the reason for why Div 2 DG would not start, there is a HIGH ASSURANCE that we can recover the Div 2 DG within the coping period. Therefore, we would continue with the SBO section 4.4.*

*DEF EALP per 4200.01: A total and sustained (>1 hour) loss of both offsite and onsite AC power sources as a result of a postulated Beyond Design Basis External Event (BDBEE) which is expected to exceed the 4 hour SBO coping period.*

*Not an ELAP. I would NOT expect the 4 hr SBO coping period to be exceeded in this situation. We have a known configuration deficiency and procedures to restore this to a normal configuration for Div 2 DG to be available within 4 hours.*

- 2) At time = 50 minutes, the field cannot identify why the division 2 DG did not start. Ameren calls the station and states that offsite power to the 138 kV line can be restored by time = 3 hours via a grid cross tie.  
As the shift manager, evaluate 4200.01, Loss of AC Power and 4306.01 Extended Loss of AC Power / Loss of Ultimate Heat Sink and determine which procedures / sections the station is currently in (Station Blackout / ELAP). Explain why.

*Still 4200.01 section 4.4, SBO and you have the entry condition for 4306.01, but cannot go further until an ELAP is assessed.*

*Still Not an ELAP. Within 1 hour action has been taken to provide a HIGH ASSURANCE of restoration of Div 1 and/or Div 2 power within the 4hr coping period.*

*I would NOT expect the 4 hr SBO coping period to be exceeded in this situation. We would be able to get an OFFSITE source available within 4 hrs for Div 1 and/or Div 2. If this progressed further, then we would re-evaluate. I would challenge AMEREN on the validity of the 3hr estimate to ensure I had a HIGH ASSURANCE.*

*DEF EALP per 4200.01: A total and sustained (>1 hour) loss of both offsite and onsite AC power sources as a result of a postulated Beyond Design Basis External Event (BDBEE) which is expected to exceed the 4 hour SBO coping period.*

- 3) At time = 45 minutes, the division 2 DG was returned to standby, however when attempting to start the engine a piston rod cracked through the casing causing substantial damage to the engine. The division 2 DG was emergency stopped by isolating fuel oil from the day tank.  
At time = 50 minutes, the TSC manager notifies the control room that they have been briefing the division 3 DG cross tie to div 2 bus as a contingency. They estimate that they could complete the cross tie procedure at approximately t = 3 hours.

As the shift manager, evaluate 4200.01, Loss of AC Power and 4306.01 Extended Loss of AC Power / Loss of Ultimate Heat Sink and determine which procedures / sections the station is currently in (Station Blackout / ELAP). Explain why. Also, explain if your decision would change if the ERO estimated completion at t=4 hours.

*Still 4200.01 section 4.4, SBO and you have the entry condition for 4306.01, but cannot go further until an ELAP is assessed.*

*Still Not an ELAP. Within 1 hour action has been taken to provide a HIGH ASSURANCE of restoration of Div 1 and/or Div 2 power within the 4hr coping period.*

*I would NOT expect the 4 hr SBO coping period to be exceeded in this situation if DIV 3 can be X-tied at time 3hr 50 minutes. We would be able to get an ONSITE source available within 4 hrs for Div 2.*

*I would continually re-evaluate this based upon how it progressed. If thought it would take longer than the 4hr SBO coping period then I would enter ELAP and leave the 4200.01, entering 4306.01.*

- 4) For any of the scenarios above, if an ELAP is not declared, would pre-staging of FLEX per 4306.01 be performed? If so, when would this be initiated? What is your reasoning for pre-staging of FLEX?

*Yes, looking ahead at the potential for an ELAP is warranted. Parallel activities that do not retract from the primary procedure requirements needed at that time is prudent, especially if the coping period may be challenged.*

#### *SBO: Technical Bases Summary*

*To avoid an unnecessary delay in taking actions for a ELAP, the SM must continually access recovery efforts. If power can NOT be restored to Div 1 or Div 2 equipment capable of removing heat from the Containment in a timely manner, direction is provided to cease SBO directed actions and immediately commence actions IAW CPS 4306.01 Extended Loss of AC Power/Loss of UHS. These actions parallel SBO actions through the 4 hour assumed coping period. These actions will provide alternate power and water sources and allow Containment heat removal.*