Dispatcher's Guide

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Supercedes Data Bulletin 1044-92 dated June 30, 2014

February 10, 2025

This guide provides a reference for basic operation of the IntelliTeam SG Automatic Restoration System. Because there are many factors, such as equipment type, settings, communications, and event timing that affect the actual outcome of a restoration event, the actual performance of the system may vary from the examples given. IntelliTeam SG system operations will be explained to show what to expect during an event.

If a factory-acceptance test (FAT) was performed as part of the IntelliTeam SG system installation, the instant replay of fault, loss-of-phase, and loss-of-source events performed on a system simulation will be made available to the FAT participants. The replays demonstrate how the IntelliTeam SG system will perform on the user's system.

The IntelliTeam SG system is native to IntelliRupter® fault interrupters and 6800 Series Automatic Switch Controls, but the IntelliTeam SG system can incorporate many intelligent electronic devices (IED) when they are equipped with an IntelliNode™ Interface Module. Because the IntelliTeam SG system takes over after the automatic functions of an IED have completed, system performance will vary depending on the device type and mix. Examples in this guide use all IntelliRupter fault interrupter systems and systems with IntelliRupter fault interrupters and 6800 Series Automatic Switch Controls. See Figure 1.

Safety is an important feature of the IntelliTeam SG system. Almost two decades of experience has gone into the design and implementation of the system features. Numerous methods are provided to manually disable the system, and a number of checks and features will automatically disable the system to avoid unexpected operation.

IntelliTeam SG System Mission

The IntelliTeam SG system automatically responds to:

- **Identify the location and types of problems.** When protection and sectionalizing have completed, it isolates distribution-circuit problems.
- **Restore power to as much of the circuit as possible.** When protection and sectionalizing have completed, the system will isolate the circuit problems if needed and restore as much load as possible, given the location of the fault and according to configured loading limits. Switches will not close if there is more load than allowed unless the **Overload Permitted** settings are configured and enabled.
- **Return the system to its Normal state.** If configured to do so, the system will attempt to return to its **Normal** state after the circuit problem has been corrected. Otherwise, manual intervention will be required to return the system to the **Normal** state.

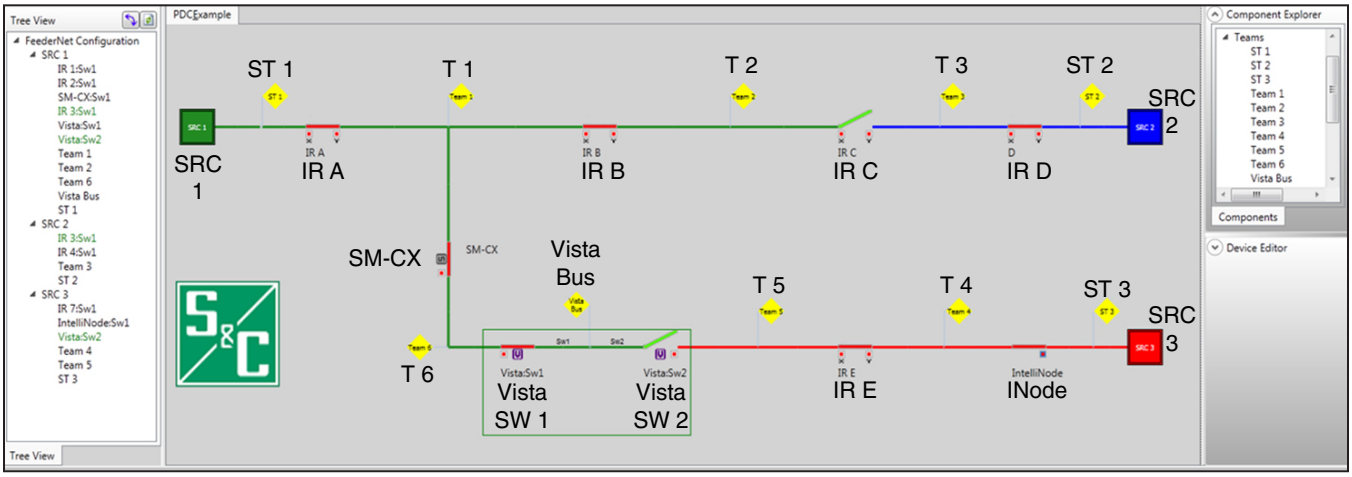

Figure 1. An example of an IntelliTeam SG system circuit.

IntelliNode Interface Module: This is a device added to a relay or recloser control to make that control part of an IntelliTeam SG system. The protective functions of the relay or control are not affected by the IntelliNode module. It will still trip and reclose as before. The IntelliTeam SG system operates after the host device has locked out.

Team Member: A team member can be a motor-operated switch (overhead or underground) with a 6800 Series Automatic Switch Control, an IntelliRupter fault interrupter, or a recloser or relay installed with an IntelliNode Interface Module.

Team: A team is any line segment bounded by IntelliTeam system devices. Any number of teams can be combined to create an automated distribution system. The circuit shown in Figure 1 on page 2 has seven teams. Team 1 has three team members: IR A, IR B, and SM-SD.

Coach: A coach travels between the IntelliTeam system devices in its team to gather information and share it among the team members. The coach is a virtual software agent that meets with the coaches of adjacent teams to ensure certain criteria are met prior to operating IntelliTeam system devices during the restoration process.

FeederNet: A FeederNet is the collection of all teams between a source and the open points. The circuit shown in Figure 1 on page 2 has three FeederNets. The FeederNet labeled SCR 1 has six team members (IR A, IR B, IR C, SM-SD, Vista:Sw1, and Vista:Sw2), four teams (Team 1, Team 2, Team 6, and Vista switchgear bus), and two open points (IR C and Vista:Sw2).

Runner: A runner travels the full length of the circuit between sources to collect information about FeederNet loading and update each device as it travels. Runners originate from the first device at each source, resulting in multiple runners existing at any given time. This continuous distribution of data means the **Rapid Self-Healing** feature can use the data that exist at each device immediately during restoration.

READY: The system must be in the **Ready** state to accomplish restoration and a return to normal.

- A team can be taken out of the **Ready** state on purpose, typically in preparation for line work.
- Loss of communication between team members can take a team out of the **Ready** state.
- A problem at an IntelliTeam system device shared between two teams can take both teams out of the **Ready** state.
- A number of factors will take the system out of the **Ready** state. They are discussed in the “Prohibit Restoration—Using Local Settings” section on page 9.

When the **ITSG/II Only** setting has been selected for a device function, the IntelliTeam system must be in the **Ready** state for that function to be enabled. Some examples are:

- Open-Source Sectionalizing
- Single-Phasing Protection and Sectionalizing
- Trip on Single-Phase Voltage
- Trip on Three-Phase Voltage
- Fault Count Detected—Counts to Trip
- Loss of Voltage Only

Rapid Self-Healing: The **Rapid Self-Healing** feature is a restoration event minimizing the number of switch operations and reducing the time required to perform a restoration. The **Rapid Self-Healing** feature is optional and must be enabled in the IntelliTeam SG system configuration.

Sequential Restoration: Also called **IntelliTeam II** mode, sequential restoration involves multiple switch operations where all IntelliTeam II system devices that experience a loss of voltage are first opened and then sequentially closed—starting at each of the available sources—and continuing until as much as the load has been picked up as possible without overloading the available sources.

An **IntelliTeam II** mode event occurs whenever the **Rapid Self-Healing** feature is not available because of insufficient capacity or if it was disabled in the system configuration. When there are multiple faults or voltage losses, **IntelliTeam II** mode will also operate for subsequent disturbances after the initial disturbance.

When a fault occurs, there are three sequential system responses: fault interruption, fault isolation, and power restoration.

The IntelliTeam SG system responds automatically to all aspects of a system problem:

- **Fault Interruption**: Not a function of the IntelliTeam SG system, it is performed by a fault-interrupting device, such as an IntelliRupter fault interrupter or the substation breaker. The IntelliTeam system does not intervene until all protection devices have locked out.
- **Fault Isolation**: When a system incorporates both sectionalizing and protective devices, the sectionalizer may provide part of the fault isolation during the interruption process. When the protective devices have locked out, the IntelliTeam SG system determines the location of the fault and initiates or completes isolation of the fault.
- **Power Restoration**: When the fault has been isolated, the IntelliTeam SG system begins the process of restoring power to as many customers as possible without overloading the available sources.

Fault in Team 6 Example

An example of interruption, isolation, and restoration is shown with the fault in Team 6 on the circuit in Figure 2.

IR A, an IntelliRupter fault interrupter in the substation, is the first fault-interrupting device between the fault and the source and opens to interrupt the fault. The **Open** operation is the result of the IntelliRupter fault interrupter's automatic protection functions. In this case, it was an IntelliRupter fault interrupter inside the substation. It could also have been either a recloser or substation breaker, with an IntelliNode Interface Module acting as a team member.

After IR A opens, the Scada-Mate® SD Switching System (SM-SD) will be opened by the automatic sectionalizing logic of its 6801 Automatic Switch Control, resulting in partial isolation of the fault. The sectionalizing logic is configured to open on first voltage loss after a fault. See the "Sectionalizing Rules" section on page 7.

The fault is now isolated from the source, so IR A can use PulseClosing® Technology to test, close, and stay closed. Until now, all switching operations have been directed by the local intelligence of protection and sectionalizing devices on the system. Communication between devices has not been a factor so far.

When those processes are complete, the IntelliTeam SG system takes over to complete the fault isolation, if necessary, and restores service as much as possible. The Team 6 coach travels between its team members to collect information about the fault. The Team 6 coach determines the IntelliTeam system must open Vista:Sw1 to complete fault isolation.

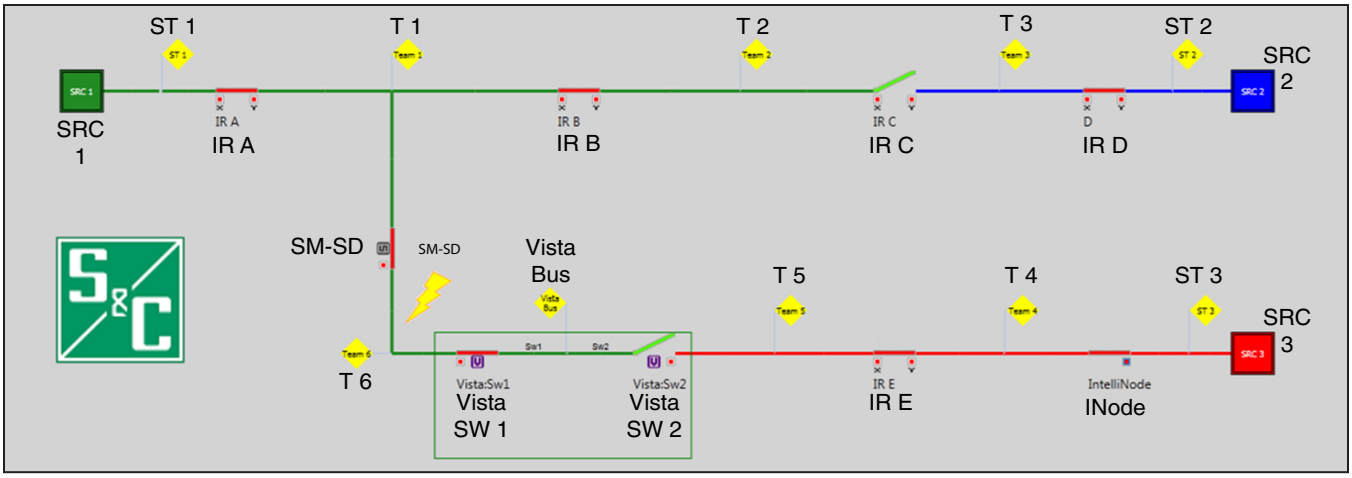

Figure 2. A fault in Team 6.

After the fault is isolated, restoration can begin. If the **Rapid Self-Healing** feature is configured, the data collected by the runners are used immediately.

Each runner carries the loading information needed to determine whether sufficient capacity is available from each open point to restore the affected segment.

If one or more of the open points has the necessary capacity available to pick up the affected segment without overloading, the IntelliTeam SG system will close the open point with the most capacity. In this case, the IntelliTeam SG system closes Vista:Sw2 to restore power to the loads connected to the Vista® Underground Distribution Switchgear's switchgear bus.

Had there been more IntelliTeam system devices in the affected feeder segment, there was an insufficient capacity from all of the open points, or the **Rapid Self-Healing** feature was not enabled, then **IntelliTeam II Mode** feature would activate. This would open all of the IntelliTeam system switches between the faulted section and the tie points and begin closing one device at a time at each available source until as much load as possible has been picked up.

An example of the **Rapid Self-Healing** feature can be demonstrated by a fault in Team 1, as shown in Figure 3.

Again, IR A is the first device between the fault and the source, so it opens to interrupt the fault. In this example, the fault is permanent, so IR A proceeds through its test sequence and locks out. When lockout has occurred, the IntelliTeam system first completes isolation of the fault and then begins the restoration process.

The coach travels through communications to each member of Team 1 and analyzes fault information from each device. Because IR B and SM-SD did not see fault current pass through them, the IntelliTeam system opens those devices to complete the fault isolation because it determined the fault is inside Team 1.

The **Rapid Self-Healing** feature is enabled in this example, so runners travel through communications to each of the open points. They find sufficient capacity is available from Source 2, so IR C is closed to return service to Team 2. Sufficient restoration capacity is also found at Source 3, so Vista:Sw2 is closed to return service to the Vista switchgear bus and Team 6.

If sufficient capacity had not been available to pick up the segment consisting of Team 6 and the Vista switchgear bus, the IntelliTeam SG system would have reverted to the **IntelliTeam II** mode and opened Vista:Sw1. After Vista:Sw1 is opened, the Vista switchgear bus coach is responsible for determining whether Vista:Sw2 could be closed to restore the Vista switchgear bus. When Vista:Sw2 closes, the coach for Team 6 attempts to determine whether Vista:Sw1 can be closed. The coach will continue to check for capacity to restore service for the duration of the configured **Prohibit Restoration Time** feature for Team 6.

If capacity becomes available before that timer expires, the IntelliTeam system will close Vista:Sw1. Otherwise, it will remain open until the system is returned to the **Normal** state. See the "Prohibit Restoration Time" section on page 12 for more information about this feature.

If the **Rapid Self-Healing** feature had been disabled, the coach for Team 2 would have been responsible for determining whether sufficient capacity was available for closing IR C to restore service to Team 2. With the **Rapid Self-Healing** feature disabled, **IntelliTeam II Mode** feature would have opened Vista:Sw1 before starting restoration.

After opening Vista:Sw1, the Vista switchgear bus coach would be responsible for determining whether Vista:Sw2 could be closed to restore the Vista switchgear bus. When Vista:Sw2 is closed, the coach for Team 6 must determine whether Vista:Sw1 can be closed. Because in this example sufficient capacity is available, the IntelliTeam system would first close Vista:Sw2 and then close Vista:Sw1 to restore service to both teams: Vista switchgear bus and Team 6.

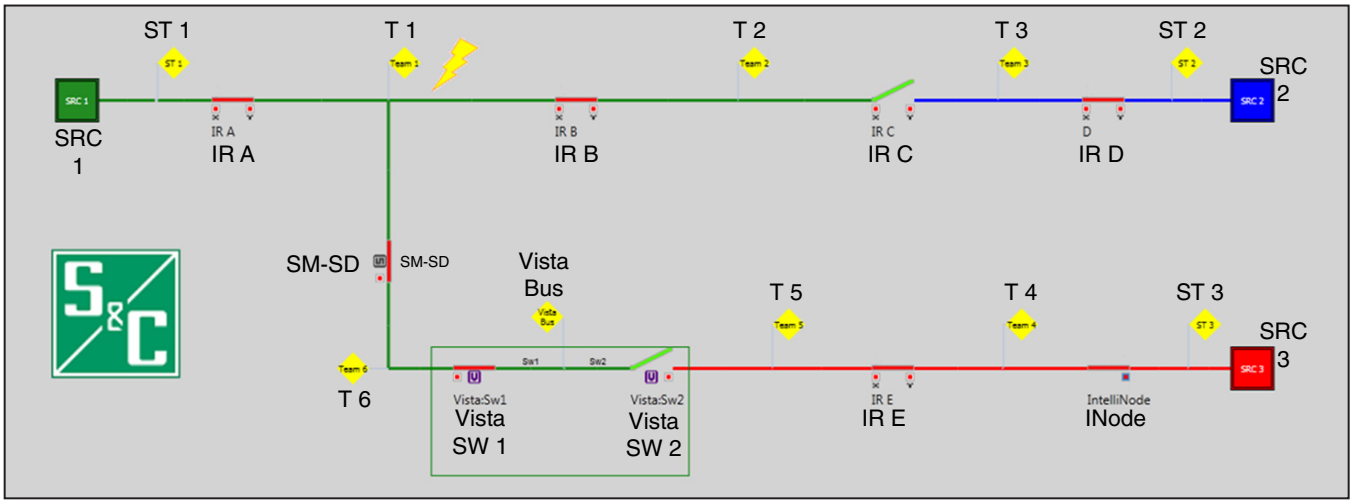

Figure 3. A fault in Team 1 is handled by the Rapid Self-Healing feature.

IntelliTeam II Automatic Restoration System operation consists of three basic parts: Sectionalizing, Restoration, and Return to Normal.

- **Sectionalizing** uses the sensors on each switch to identify loss of voltage and to determine whether fault current has passed through the switch.

  It then determines when to open the switches. IntelliRupter fault interrupters, or reclosers and relays with an IntelliNode module, will trip and reclose as determined by their protection settings. Both sectionalizing and protection are completed before restoration. Communication is not needed to sectionalize or interrupt a fault unless **ITSG/II Only** mode has been selected for sectionalizing.

- **Restoration** uses information gathered by the IntelliTeam system devices just prior to a system event, along with communication among IntelliTeam system devices, to determine the best way to restore the circuit. The faulted section is isolated and not restored. Communication between IntelliTeam system devices is essential for restoration.

- **Automatic Return to Normal** uses configured switch definitions to determine the normal system configuration. It then returns to that configuration when the problem has been fixed. Again, communication is essential to complete the Return to Normal event. The **Automatic Return to Normal** feature is optional and can be disabled.

  Manual Return to Normal is required when the **Return to Normal** mode is configured for "None." Manual intervention is required to put the system back into the **Normal** state. This can be accomplished locally or through SCADA.

Sectionalizing Rules

Switches when configured with 6800 Automatic Switch Controls, will sectionalize when any of the following occur:

- A switch sees a number of Loss-of-Voltage and Fault-Current events that exceed the **Loss-of-Voltage Counter** setting.

- A switch sees a number of Loss-of-Voltage events that exceed the **Loss-of-Voltage Counter** setting.

- A switch sees loss of voltage for a period longer than the **Loss-of-Voltage Timer** setting.

- Switches use local control logic to open; they don't need to communicate unless configured for **ITSG/II Only** mode.

Reclosers and relays with an IntelliNode module still trip and reclose as determined by their protection settings.

- The IntelliTeam system will open the device if it sees a loss of voltage for a period exceeding the **Loss-of-Voltage Timer** setting.

- The IntelliTeam system will open the device if it determines the operation is needed to isolate a fault or the coach needs to open the device to begin sequential restoration.

All IntelliTeam system devices on a circuit beyond the faulted section open.

- They react to the events outlined above without communicating with each other. By opening all IntelliTeam SG system devices, the restoration process can proceed in an orderly manner, allowing the restoration process to systematically check for any possible **Overload** conditions.

Completion of the sectionalizing process triggers the restoration process.

- Sectionalizing should start quickly, but because the IntelliTeam II system works in conjunction with the reclosing settings of the substation breakers and mid-line reclosers, sectionalizing completion will be determined by the number of **Reclosing** operations in use and the time between **Reclosing** operations.

- When all switches have been opened between the faulted section and the tie point, the system starts looking for ways to accomplish its second mission: restoring service. Sectionalizing and restoration can occur simultaneously in different sections of the affected circuit. It depends on how different devices were configured for coordination with the breaker. All switches do not have to be open before restoration begins. However, in this mode, the tie-switch can't close into a team with a closed switch.

Automatic Return to Normal

Following a reconfiguration event involving a fault and subsequent repair and restoration of the faulted line section, team members can automatically return to their **Normal** state.

- When restoration occurred because of a loss-of-voltage at the preferred source substation, the team connected to that substation will sense when it has been reenergized for a configured period of time and automatically return to its original switch configuration if the **Return to Normal** feature is enabled.
- When restoration occurred as the result of a fault, **Return to Normal** mode is initiated by manually closing the first upstream switch of the faulted line section, either by a local command or via SCADA. Teams downstream of the previously faulted team sense the line segment has been re-energized for a configured period of time and automatically return to the original switch configuration if the **Return to Normal** feature is enabled.
- If at any time the affected teams are taken out of the **Ready** state (by placing the switch control ENABLE/DISABLE switch in the **Disabled** state, for example), the **Automatic Return to Normal** feature is canceled and must be accomplished manually.
- When enabled, the **Return to Normal** feature can be set for either open or close transition.

Manual Return to Normal

If the **Return to Normal** feature is set to "None," switch controls must be manually reset to return the teams to their **Normal** operation state. Switch controls must be checked to see they have no errors, faults, or communication problems so they can enter the **Ready** state. The following steps are necessary to manually return a system to its **Normal** state:

STEP 1. Crews complete repair of the faulted line segment in accordance with utility safety and operation practices.

STEP 2. Every switch in the team bounding the faulted line segment must be set to its **Normal** position. Switching may be performed locally or by SCADA command if available.

STEP 3. The **Automatic Operation** feature may have been disabled before or after the manual operation, but every switch manually operated to return its team to the **Normal** state must have the **Automatic Operation** feature enabled after being switched.

STEP 4. If IntelliRupter fault interrupters, reclosers, or relays with IntelliNode modules are operated during this process, they will have a **Manual Override** alarm that requires clearing. This can be accomplished by a SCADA or local command.

STEP 5. Work outward from the repaired line section to return each reconfigured team to its **Normal** state.

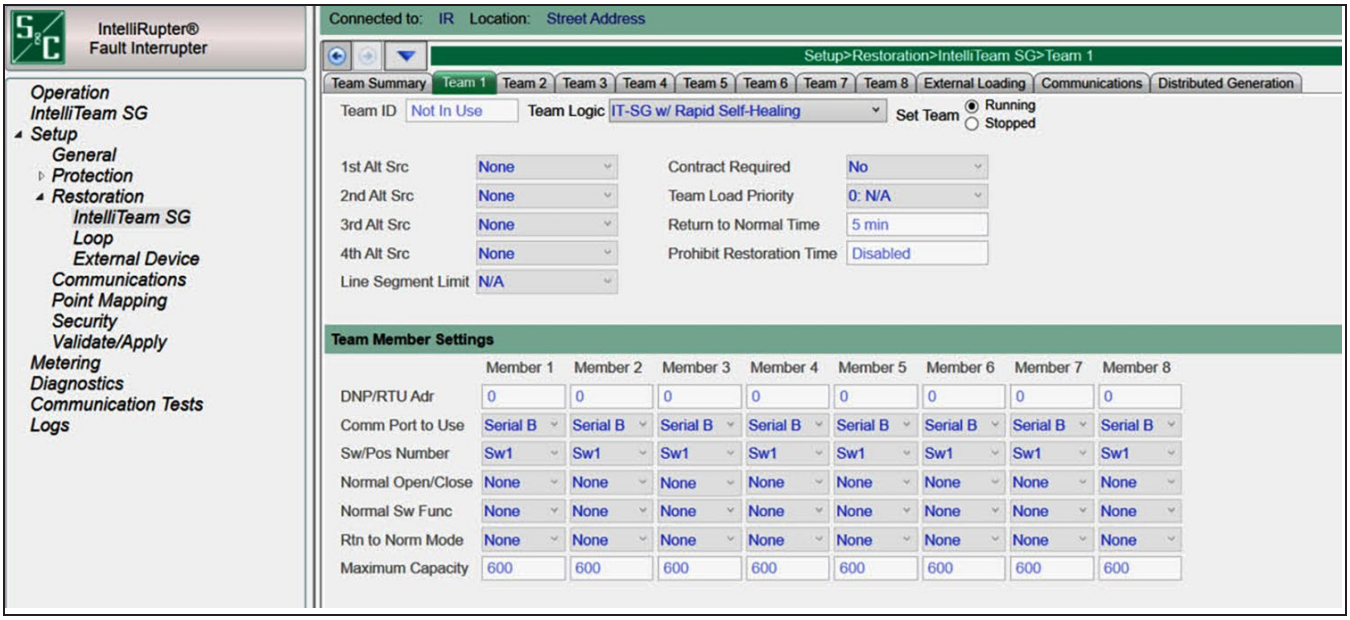

Figure 4. The *IntelliTeam SG>Team* screen.

In case of an emergency or for circuit situations where automatic restoration would be undesirable, the **Automatic Restoration** feature can be disabled with local control settings or by a SCADA command. When the **Automatic Restoration** feature is disabled at any control, all teams with that control will be taken out of the **Ready** state. All other teams will continue to operate.

IntelliRupter® PulseCloser® Fault Interrupters

The **Automatic Restoration** feature can be disabled with a SCADA **Prohibit Restoration** command, which prevents the IntelliRupter fault interrupter and any IntelliTeam SG system devices in any team in which it participates from automatically closing to restore load under any circumstances. The IntelliRupter fault interrupter can still trip and use a pulse to test the line as determined by the **Testing After Initial Trip** setting in the active protection profile.

The **Prohibit Restoration** command only prevents the IntelliTeam SG system logic from being able to open or close the device.

To indicate an IntelliRupter fault interrupter has been set to the **Automatic Restoration Prohibited** state:

- The *Operation* screen indicates “Alarm” in the **Status** field.
- The **Ready Status** field on the *IntelliTeam SG>Team Summary* and *IntelliTeam SG>Team* screens will display the **Alarm** condition. See Figure 4 on page 8.
- A DNP status point will be set.
- The **Ready** status of the team does not affect a PulseClosing® Technology operation or other protective functions. The device will still trip and use a pulse to test the line as before, regardless of whether the team is in the **Ready** state.
- The team can be taken out of the **Ready** state through Wi-Fi by clicking on the **IntelliTeam SG Restoration** slide button found on the *Operation* screen and on the *IntelliTeam SG>Team Summary* screen. When “Disabled” is selected and the **Prohibit Restoration** state entered, the IntelliTeam SG system cannot automatically operate the IntelliRupter fault interrupter.
- The **Hot Line Tag** mode will also activate the **Prohibit Restoration** mode in that IntelliRupter fault interrupter.
- The status of the IntelliRupter fault interrupter **Prohibit Restoration** mode does not prevent operation of that IntelliRupter fault interrupter through the SCADA system.

6800 Series Controls

Automatic restoration can be disabled by the SCADA **Prohibit Automatic Restoration** command, which prevents the local switch and any IntelliTeam SG system devices in any team in which its switch control participates from automatically closing to restore load under any circumstances.

Automatic operation, including restoration, can be disabled with the SCADA **Disable Automatic Operation** command, which prevents the local switch and any IntelliTeam SG system devices in any team in which its switch control participates from automatically closing to restore load under any circumstances. The command prevents the local **Sectionalizing** function from opening the switch.

To indicate a team has been set to the **Automatic Restoration Prohibited** state:

- The *Team Operation* screen will indicate “Alarm” in the **Ready Status** field.
- The front panel LCD screen will indicate “Alarm” instead of “Ready” for that team.
- A DNP status point will be set.
- Any switch can be disabled by setting the AUTOMATIC OPERATION switch on the front panel of its 6800 Series control to the **Disabled** setting or placing the AUTOMATIC RESTORATION switch on the front panel to the **Prohibited** setting. In either case, the setting is changed by pushing the CHANGE button for the stated indication. See Figure 5 on page 10.

Placing the **Automatic Operation** feature in the **Disabled** state prevents any automatic control operation.

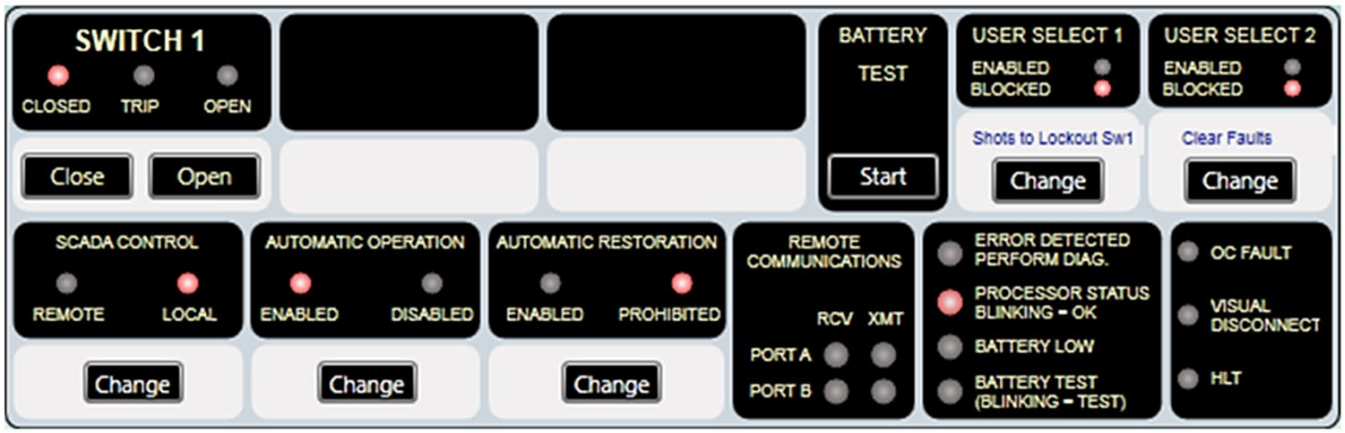

Figure 5. The 6801 control *Operation* screen controls.

Placing the **Automatic Operation** feature in the **Disabled** state prevents any automatic control operation. When disabled, the line switch will not automatically open or close.

Placing the control in the **Automatic Restoration Prohibited** state prevents the IntelliTeam SG system from automatically operating the control but leaves the **Automatic Sectionalizing** feature active, if configured.

- If a team is not in the **Ready** state but the line switch **Automatic Operation** feature is enabled, it will act like an overcurrent sectionalizer. The device can open in response to a downstream fault but will never automatically close.
- Any switch can have remote operation blocked by setting the SCADA CONTROL switch on the front panel to the **Local** position. This does not prevent sectionalizing or restoration, but it does prevent operation of the switch through the SCADA system.

IntelliNode™ Interface Modules

Automatic restoration can be disabled with the SCADA **Prohibit Restoration** command, which prevents the IntelliNode module and any IntelliTeam SG system devices in any team in which it participates from automatically closing to restore load under any circumstances. The recloser or relay can still trip and reclose. The **Prohibit Restoration** command only prevents the IntelliTeam SG system logic from being able to close the device.

To indicate an IntelliNode module is set to the **Automatic Restoration Prohibited** state:

- The *Team Operation* screen will indicate “Alarm” in the **Ready Status** field.
- The front panel LCD screen will indicate “Alarm” instead of “Ready” for that team.
- A DNP status point will be set.
- The **Ready** status of the team does not affect the recloser or relay protective functions. The device will still trip and reclose as before, regardless of whether the team is in the **Ready** state. The **Ready** state is shown on the *Team Summary* screen. See Figure 6 on page 11.
- The team can be taken out of the **Ready** state on the IntelliNode module faceplate by pressing the CHANGE button next to the PROHIBIT RESTORATION STATUS indicator. When the IntelliNode module is in the **Prohibit Restoration Enabled** state, the IntelliTeam SG system cannot automatically operate the device. The team can also be taken out of the **Ready** state by moving the **IntelliTeam SG Restoration** slide button to “Disabled” on the *IntelliTeam SG>Team Summary* screen.
- If the **Hot Line Tag** feature is configured, placing a recloser in **Hot Line Tag** mode will also activate the **Prohibit Restoration** mode in the IntelliNode module.
- The status of the IntelliNode module’s **Prohibit Restoration** mode does not prevent operation of the recloser or relay through the SCADA system.

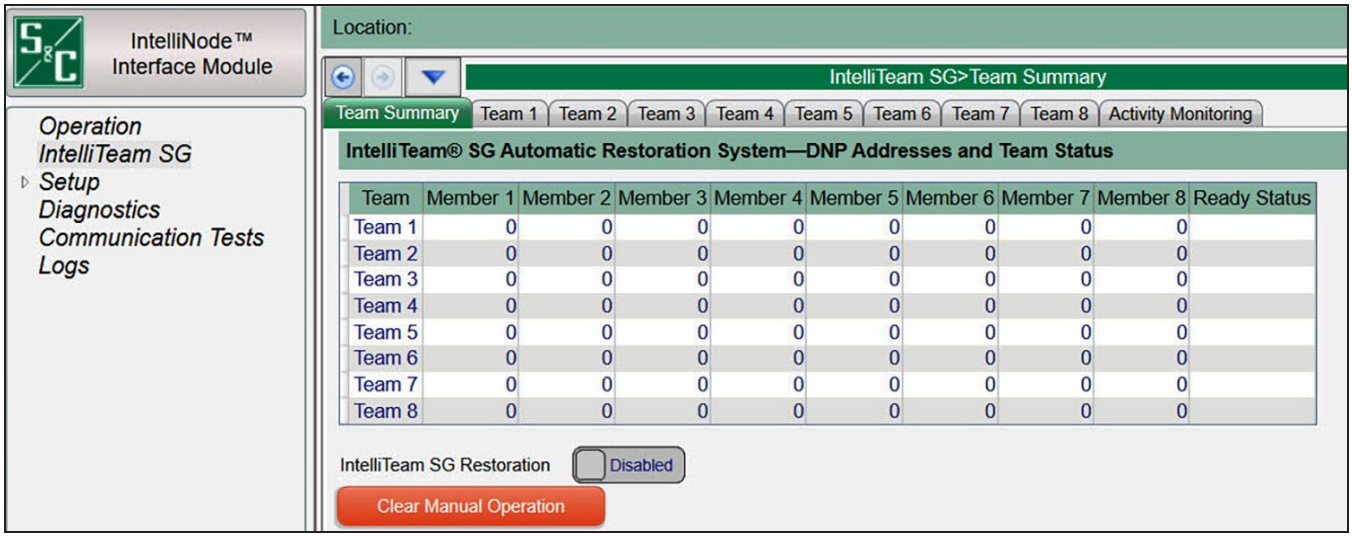

Figure 6. The IntelliNode module *IntelliTeam SG>Team Summary* screen.

Team Not Ready

A team will automatically go out of the **Ready** state, and display an alarm, if any of the following occur:

- The IntelliTeam system communication is not available.
- The system detects a problem at one of the team devices, such as a bad battery or an open visual disconnect.
- A device has been manually operated or disabled.
- A substation relay or recloser with an IntelliNode module has been placed in **Local** or **Hot Line Tag** mode.
- The switch state does not match the normal switch position after a new FeederNet has been pushed to the device.

The IntelliTeam system depends on reliable communication. When the system was installed, S&C and/or the user's company performed a site survey to ensure proper communication between switches and back to the master station or gateway radio.

Communication might break down for a number of reasons. Over time, trees grow and impede radio signals. New buildings can block signals. Severe weather may interrupt an already-weak signal. Sometimes a radio can malfunction or its backup battery goes dead.

If a radio is used as a repeater link and its signal is blocked, communication to a number of devices may be impeded. The symptom may be a large number of out-of-scan or similar SCADA alarms.

If communication between switches breaks down, the affected team(s) will take themselves out of the **Ready** state, preventing automatic switch closing. Automatic restoration will be prevented, but the switches can still be operated locally. They also can open automatically by using local control logic unless the **ITSG/II Only** mode was configured. Switches taken out of the **Ready** state because of a non-communicating team member can still be operated remotely if communications are not affected.

If the link from the IntelliTeam system to the master station is impeded, it's possible that automatic system operation will not be affected. The SCADA system may indicate an **Out of Scan** condition, but as long as the team members can communicate with each other and there are no other conditions to create an alarm, the IntelliTeam system will remain operational.

Prohibit Restoration Time

Each team has a **Prohibit Restoration Timer** setpoint. The team can continue to look for restoration capacity for this time interval after the initial attempt was rejected because of insufficient capacity. This time period is typically shorter than the time it takes a crew to get to the site. Setting the **Prohibit Restoration Timer** setpoint to "Disabled" allows an unlimited number of subsequent attempts to restore the team.

Manual Operation

When an IntelliTeam system device is operated manually, a **Manual Operation** alarm is set and the teams this device belongs to are taken out of the **Ready** state. A manual operation can be executed with a faceplate, IntelliLink software, or SCADA command.

When set, the **Manual Operation** alarm must be cleared after the device has been returned to its normal position by either a local or SCADA **Clear Manual Operation** command. If the **Auto-Clear Manual Op** mode has been configured, the device is in its normal switch position, and no other error conditions exist, the **Manual Operation** alarm will automatically clear after the **Time to Clear Manual Op** timer expires.

This section provides guidance for when the IntelliTeam SG system does not seem to work as expected. Unique situations do occur on power systems, and other utility practices could be different. A utility's practices and procedures supersede any suggested action in this section.

Report any unusual operations to the local S&C Sales Office or S&C Authorized Distributor. Their telephone numbers are listed on S&C's website, **sandc.com**, or call the S&C Global Support and Monitoring Center at 1-888-762-1100.

Team Not in Ready State with Bad Communication

When a team member has lost communication, its team will go out of the **Ready** state. Only teams that include the member with communication loss are affected.

Communication may become intermittent because of environmental conditions, such as an increase in vegetation combined with bad weather. Intermittent loss of communication can result in a team temporarily going out of the **Ready** state. When communication returns, the IntelliTeam system will automatically return to the **Ready** state.

If communication loss is permanent, the IntelliTeam system will remain disabled and out of the **Ready** state until the problem is corrected. Other teams with good communication will remain operational.

Team Not in Ready State with Good Communication

Follow these steps when the team has good communication and all switches are in the proper position, but the team is not in the **Ready** state:

STEP 1. Make sure all switch controls have **Automatic Operation** mode enabled.

STEP 2. Make sure all IntelliNode modules have **Automatic Restoration** mode enabled (**Prohibit Restoration** mode is disabled).

STEP 3. Make sure there are no device alarms. The team won't go into the **Ready** state when a switch control has detected an operational problem, such as a bad battery, a **Switch-Position Indication** error, or a product-specific indication such as an **Open Visible Disconnect** condition on a Scada-Mate Switching System or low gas pressure on Vista Underground Distribution Switchgear.

STEP 4. Make sure none of the devices have been operated manually. If any have, there will be a **Manual Operation** alarm.

To remotely clear this alarm, send the **Clear Manual Operation** command. The alarm can also be cleared locally with the **Clear Manual Operation** button on the *IntelliTeam SG>Team Summary* screen. See Figure 6 on page 11.

Additionally, 6800 Series controls can be cleared from the front panel with an LCD screen command (see S&C Instruction Sheet 1045-540, "6800 Series Automatic Switch Controls: *Operation"*), or a **Manual Operation** alarm can be cleared with a configured **User Select** button (see S&C Instruction Sheet 1045-530, "6800 Series Automatic Switch Controls: *Setup*).

When the **Auto-Clear Manual Op** mode is set to "Yes," the **Manual Operation** alarm will automatically clear after the **Time to Clear Manual Op** timer expires.

No Automatic Close

When devices are communicating properly, but a device did not automatically close to restore power when it should have, the reason may be:

- An IntelliTeam system device will not close automatically when it is not in the **Ready** state.
- When a team is in the **Ready** state, the restoration process may have exceeded the configured load limits, preventing the automatic close operation. The historic log will contain an entry indicating insufficient capacity as the cause of the denied transfer. Determine whether loading limits set for the devices are appropriate.

IntelliTeam Instruction Sheets For Specific Applications

The following instruction sheets are available for specific IntelliTeam Automatic Restoration System topics:

- S&C Instruction Sheet 1044-574, "IntelliTeam® Designer: Applies to Firmware Versions Earlier than Version 7.3: *Closed-Loop Operation*"
- S&C Instruction Sheet 1044-575, "IntelliTeam® Designer: *Phase-Loss Isolation*"
- S&C Instruction Sheet 1044-576, "IntelliTeam® Designer: *Single-Phase Trip and Lockout*"
- S&C Instruction Sheet 1044-577, "IntelliTeam® II Automatic Restoration System: *Setup and Configuration*"
- S&C Instruction Sheet 1044-578, "IntelliTeam® SG Automatic Restoration System: Distributed Generation: *Setup and Configuration*"
- S&C Instruction Sheet 1044-579, "IntelliTeam® SG Automatic Restoration System: *Remote Transfer Trip Setup and Configuration*"
- S&C Instruction Sheet 1044-580, "IntelliTeam® Designer: Applies to Firmware Version 7.3 and Later: *Closed-Loop Operation*"
- S&C Instruction Sheet 1044-583, "IntelliTeam® SG Automatic Restoration System: *Load-Scaling Setup and Configuration*"
- S&C Instruction Sheet 1044-584, "IntelliTeam® SG Automatic Restoration System: *Maximum Capacity Setup and Configuration*"
- S&C Instruction Sheet 1044-585, "IntelliTeam® SG Automatic Restoration System: *Available Source Capacity Calculation and Configuration*"