



**TEXAS RE**

Ensuring electric reliability for Texans

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# **TOP and IRO Standards**

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# TOP\_IRO Standards Enforcement Dates

New Standard	Requirement	Old Standard to Retire	Retirement Date of Old Standard	Enforcement Date (beginning)
<a href="#"><u>IRO-001-4</u></a>	All (R1-R3)	<a href="#"><u>See IP</u></a>	<a href="#"><u>See IP</u></a>	4/1/2017
<a href="#"><u>IRO-002-4</u></a>	All (R1-R4)	<a href="#"><u>See IP</u></a>	<a href="#"><u>See IP</u></a>	4/1/2017
<a href="#"><u>IRO-008-2</u></a>	All (R1-R6)	<a href="#"><u>See IP</u></a>	<a href="#"><u>See IP</u></a>	4/1/2017
<a href="#"><u>IRO-010-2</u></a>	See Table	<a href="#"><u>See IP</u></a>	<a href="#"><u>See IP</u></a>	1/1/2017
<a href="#"><u>IRO-014-3</u></a>	All (R1-R7)	<a href="#"><u>See IP</u></a>	<a href="#"><u>See IP</u></a>	4/1/2017
<a href="#"><u>IRO-017-1</u></a>	All (R1- R4)	<a href="#"><u>See IP</u></a>	<a href="#"><u>See IP</u></a>	4/1/2017
<a href="#"><u>TOP-001-3</u></a>	All (R1-R20)	<a href="#"><u>See IP</u></a>	<a href="#"><u>See IP</u></a>	4/1/2017
<a href="#"><u>TOP-002-4</u></a>	All (R1-R7)	<a href="#"><u>See IP</u></a>	<a href="#"><u>See IP</u></a>	4/1/2017
<a href="#"><u>TOP-003-3</u></a>	See Table	<a href="#"><u>See IP</u></a>	<a href="#"><u>See IP</u></a>	1/1/2017

# IRO-010-2 Implementation Plan

- **Standard Enforcement Date: First day of first calendar quarter nine months after effective date of order = 1/1/2017**

Requirement	Compliant By
R1, R2	1/1/2017
R3	4/1/2017

# TOP-003-3 Implementation Plan

- **Standard Enforcement Date: First day of first calendar quarter nine months after effective date of order = 1/1/2017**

Requirement	Compliant By
R1, R2, R3, R4	1/1/2017
R5	4/1/2017

# Revised Definitions

**Operation Planning Analysis-** An evaluation of projected system conditions to assess anticipated (pre-Contingency) and potential (post-Contingency) conditions for next-day operations. The evaluation shall reflect applicable inputs including, but not limited to: load forecasts; generation output levels; Interchange; known Protection System and Remedial Action Scheme status or degradation, functions, and limitations; Transmission outages; generator outages; Facility Ratings; and identified phase angle and equipment limitations. (Operational Planning Analysis may be provided through internal systems or through third-party services.)

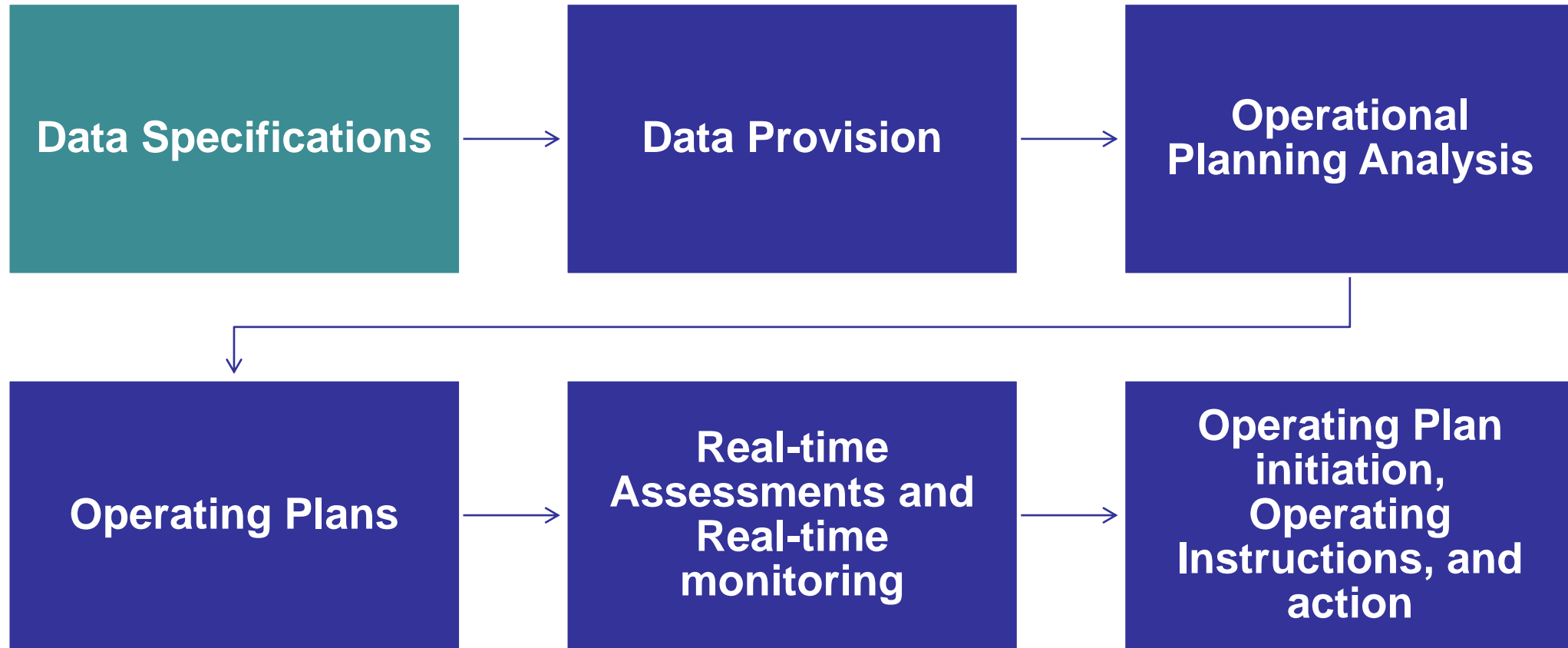
**Real-Time Assessment-** An evaluation of system conditions using Real-time data to assess existing (pre-Contingency) and potential (post-Contingency) operating conditions. The assessment shall reflect applicable inputs including, but not limited to: load; generation output levels; known Protection System and Remedial Action Scheme status or degradation, functions, and limitations; Transmission outages; generator outages; Interchange; Facility Ratings; and identified phase angle and equipment limitations. (Real-time Assessment may be provided through internal systems or through third-party services.)

## Other Definitions

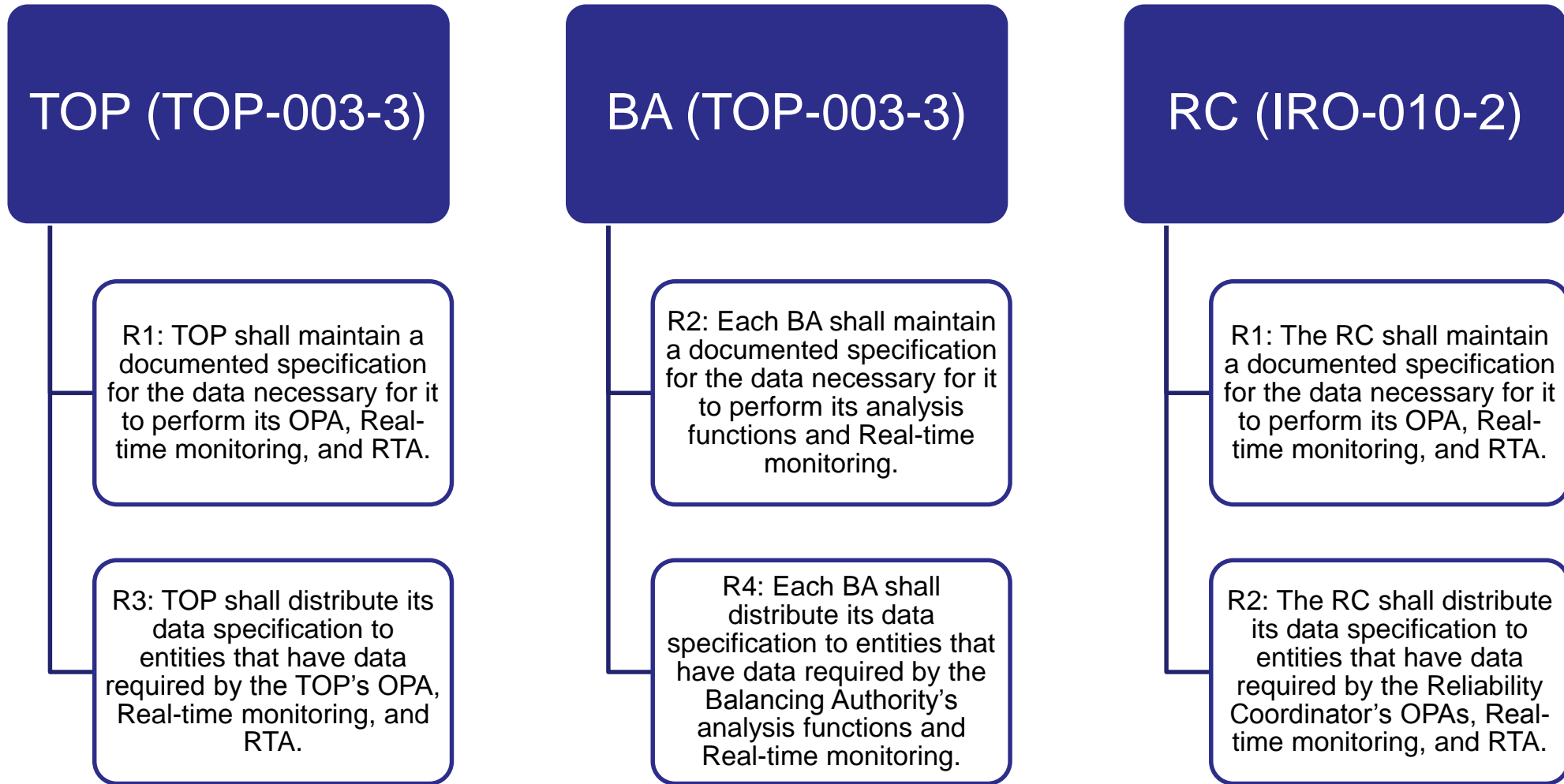
**Operating Instruction-** A command by operating personnel responsible for the Real-time operation of the interconnected Bulk Electric System to change or preserve the state, status, output, or input of an Element of the Bulk Electric System or Facility of the Bulk Electric System. (A discussion of general information and of potential options or alternatives to resolve Bulk Electric System operating concerns is not a command and is not considered an Operating Instruction.)

**Operating Plan-** A document that identifies a group of activities that may be used to achieve some goal. An Operating Plan may contain Operating Procedures and Operating Processes. A company-specific system restoration plan that includes an Operating Procedure for black-starting units, Operating Processes for communicating restoration progress with other entities, etc., is an example of an Operating Plan

# Key Concepts



# Data Specification





# Data Specification - TOP CFR Considerations

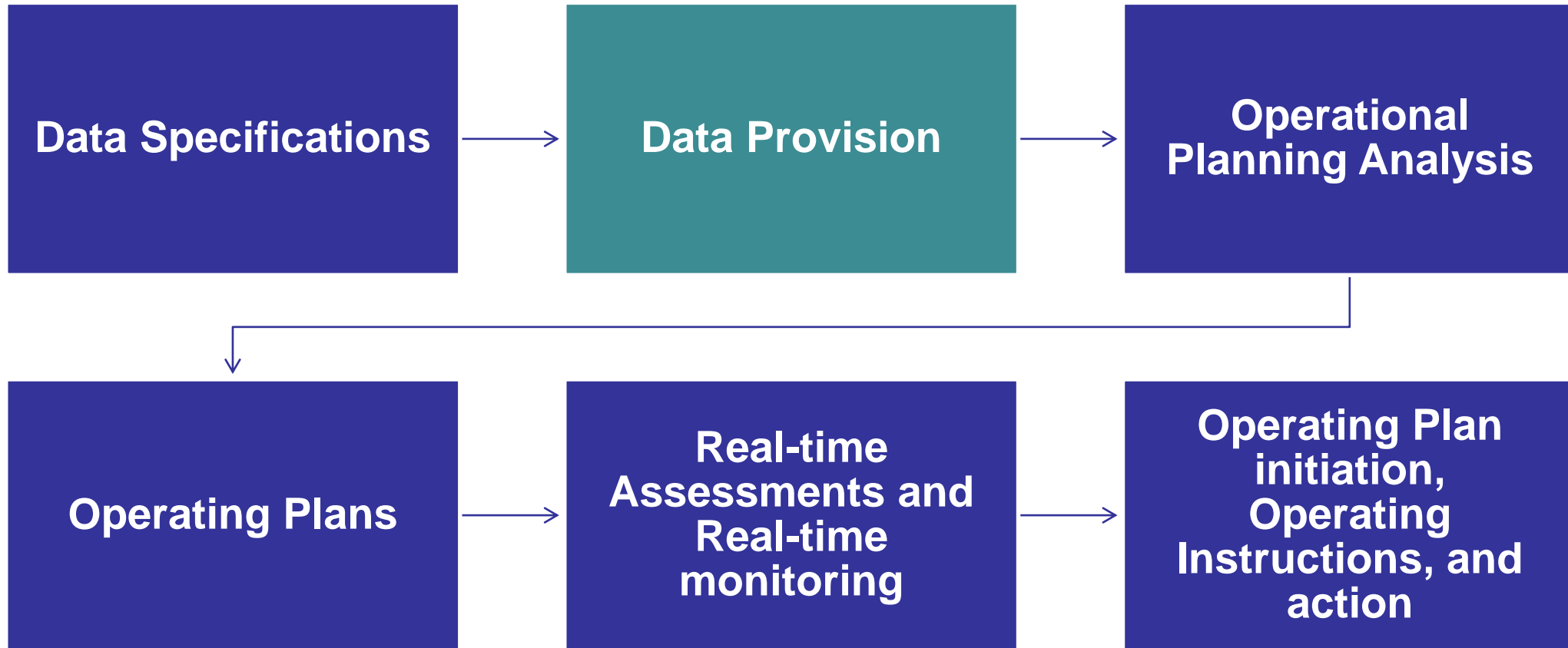
ERCOT is responsible for maintaining data specifications for:

- OPA
- RTA
- Real-time monitoring

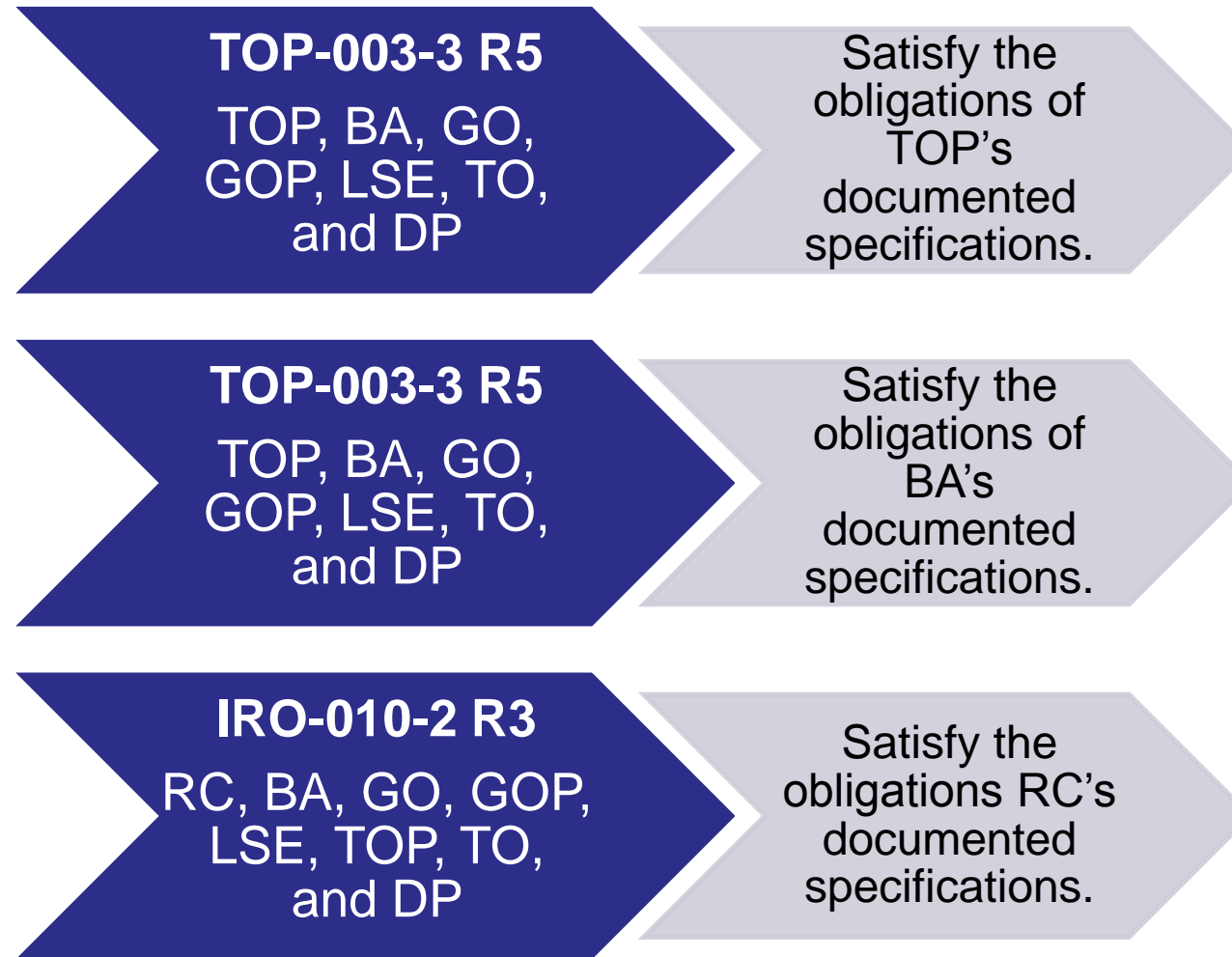
Local Control Center TOPs are responsible for maintaining data specifications for:

- Real-time monitoring

# Key Concepts



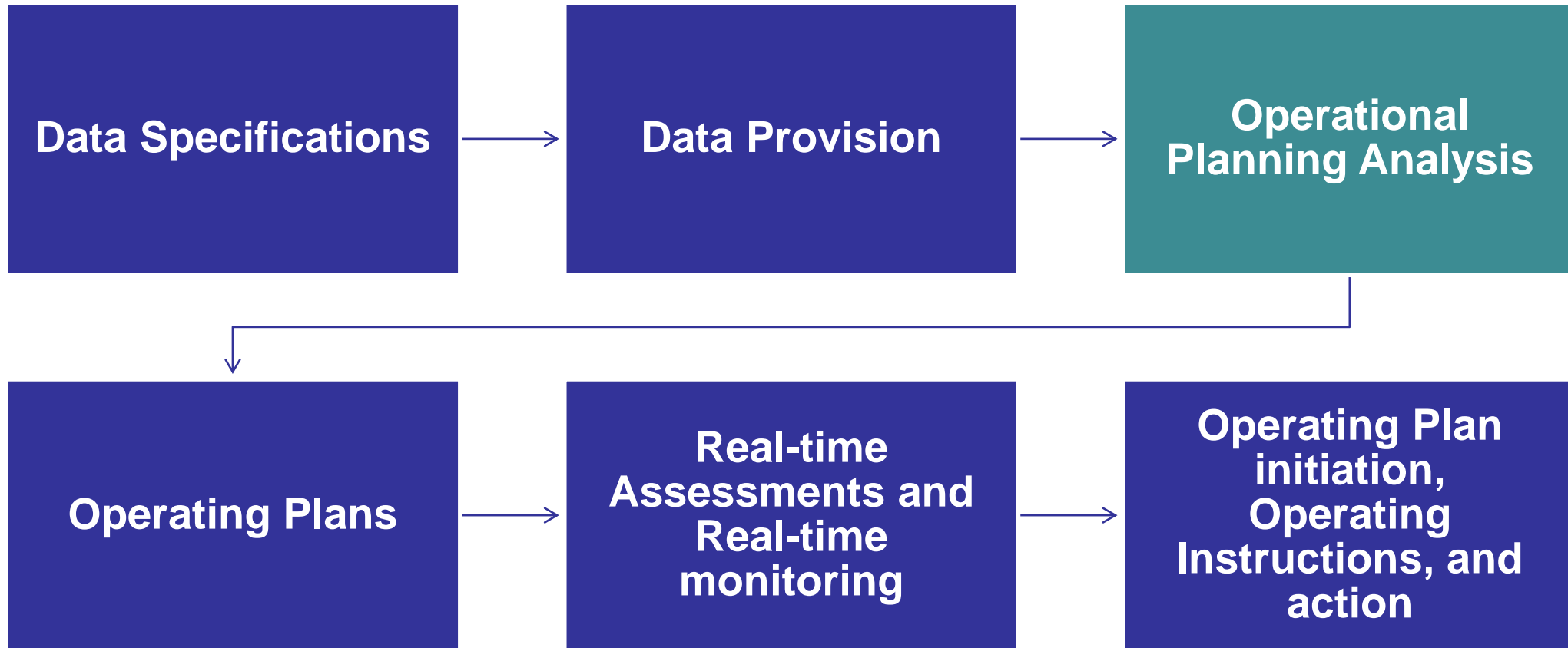
# Data Provision



## Specified data must be provided using:

- A mutually agreeable format
- A mutually agreeable process for resolving data conflicts
- A mutually agreeable security protocol

# Key Concepts



# Operational Planning Analysis

## TOP (TOP-002-4)

R2: Each TOP shall have an OPA that will allow it to assess whether its planned operations for the next day within its TOP Area will exceed any of its SOLs.

## RC (IRO-008-2)

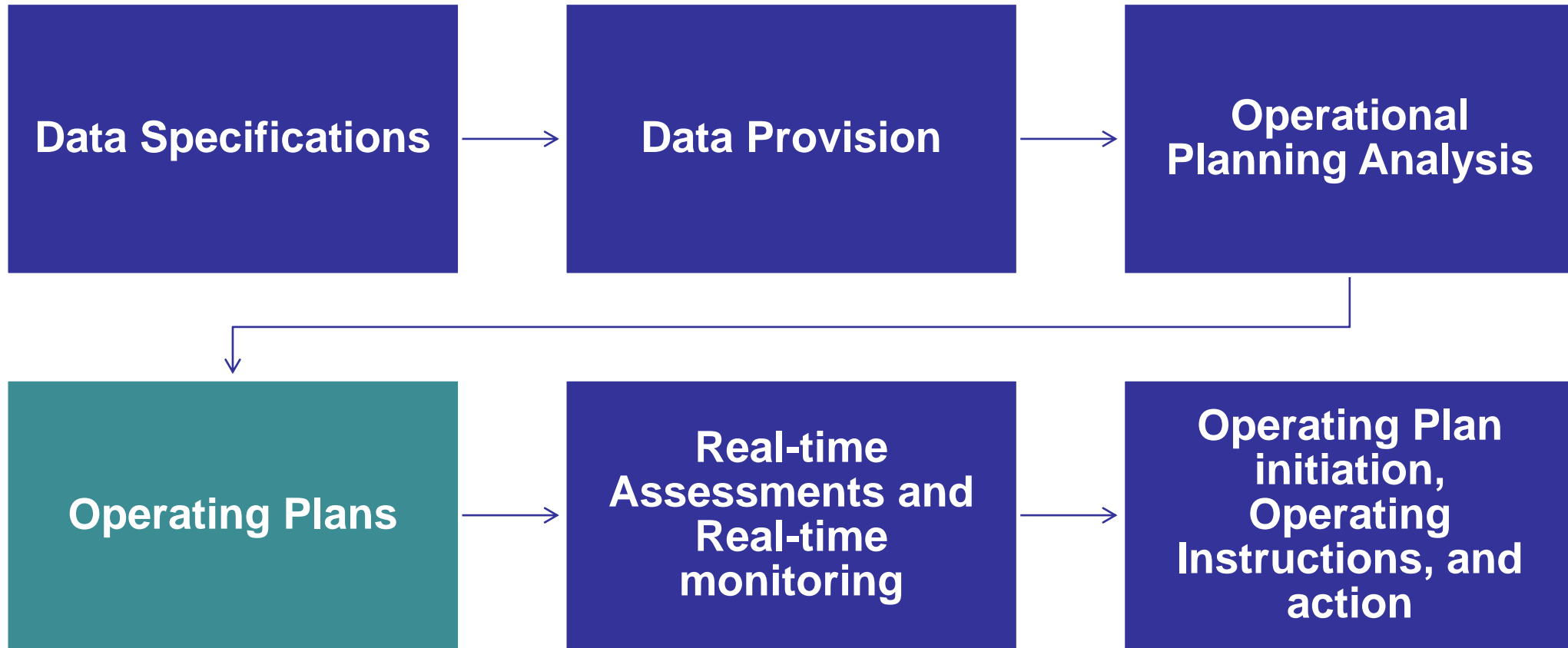
R1: Each RC shall perform an OPA that will allow it to assess whether the planned operations for the next-day will exceed SOLs and IROLs within its Wide Area.

# Operational Planning Analysis - TOP CFR Considerations

**TOP-002-4 R2- Each TOP shall have an OPA.**

- ERCOT is responsible for having an OPA as a TOP.
- Local Control Center TOPs are not required to have an OPA.

# Key Concepts





# Operating Plans

## TOP (TOP-002-4)

R2: Each TOP shall have an OP(s) for next-day operations to address potential SOL exceedances identified as a result of its OPA as required in R1.

R3: Each TOP shall notify impacted NERC registered entities identified in the OP(s) cited in R2 as to their role in those plan(s).

## BA (TOP-002-4)

R4: Each BA shall have an OP(s) for the next-day that addresses, expected generation resource commitment and dispatch, Interchange scheduling, demand patterns, and capacity and energy reserve requirements, including deliverability capability.

R5: Each BA shall notify impacted NERC registered entities identified in the OP(s) cited in R4 as to their role in those plan(s).

## RC (IRO-002-4)

R2: Each RC shall have a coordinated OP(s) for next-day operations to address potential SOL and IROL exceedances identified as a result of its OPA as performed in R1 while considering the Ops for the next-day provided by its TOPs and BAs.

R3: Each RC shall notify impacted entities identified in its OP(s) cited in R2 as to their role in such plan(s).

# Operational Plans - TOP CFR Considerations

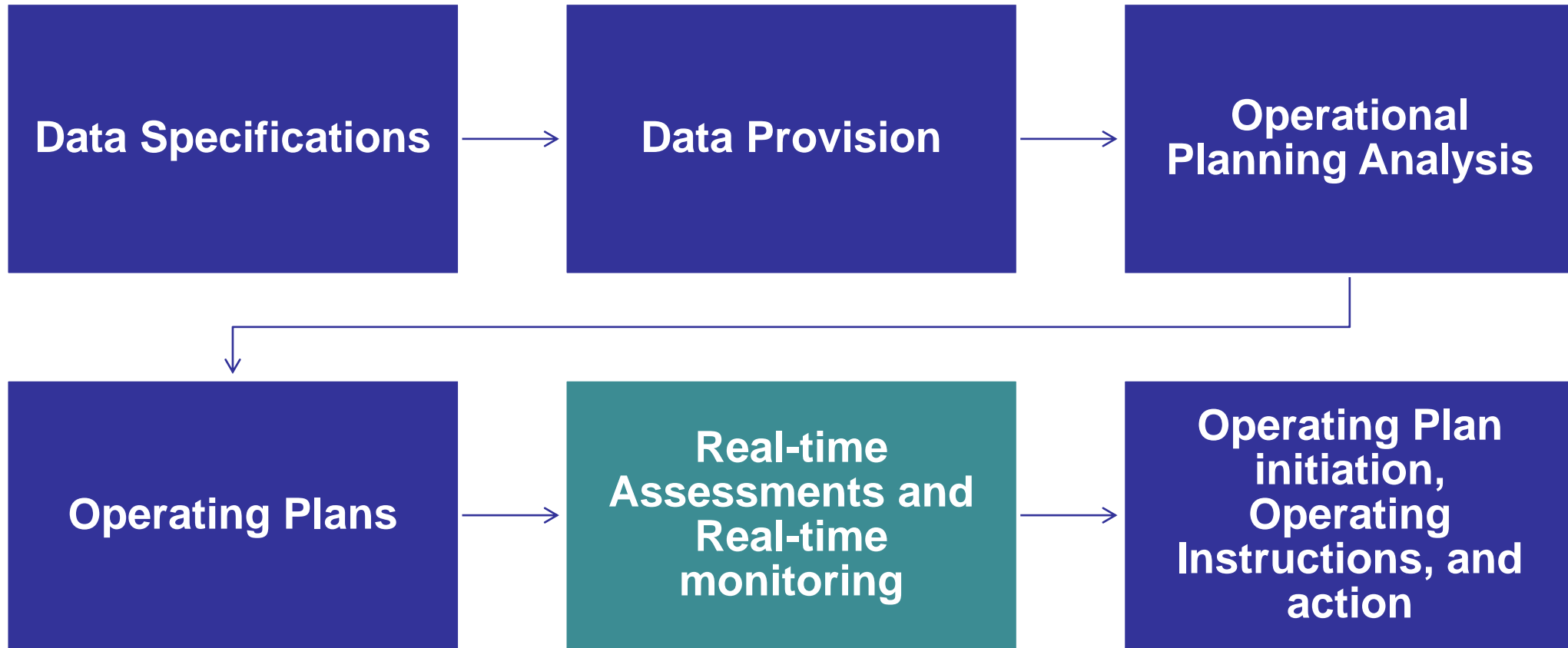
**TOP-002-4 R2: Each TOP shall have an Operating Plan for next-day operations to address potential SOL exceedance identified as result of OPA.**

- ERCOT is responsible for having an Operating Plans to address issues identified in OPA.
- Local Control Center TOPs are not required to perform an OPA, and therefore are not required to have Operating Plans for R2.

**TOP-002-4 R3: Each TOP shall notify entities identified in Operating Plans cited in R2 as to their role in those plan(s).**

- ERCOT is responsible for notifying entities identified in Operating Plans developed as a result of OPA.
- Local Control Center TOPs are not required to have Operating Plans cited in R2, and therefore are not required to notify entities.

# Key Concepts



# Real-Time Assessment

**TOP (TOP-001-3)**

R13: Each TOP shall ensure that a RTA is performed at least once every 30 minutes.

**RC (IRO-008-2)**

R4: Each RC shall ensure that a RTA is performed at least once every 30 minutes.

# Real-Time Assessment - TOP CFR Considerations

**TOP-001-3 R13- Each TOP shall ensure a RTA is performed at least once every 30 minutes**

- ERCOT is responsible for performing RTA as a TOP.
- Local Control Center TOPs are not required to perform a RTA.

## TOP-001-3 R13 Rationale

- Standard Rationale states refers to an Operating Plan for performing the RTA .
- “Operating Plan should contain instructions as to how to perform Operational Planning Analysis and Real-time Assessment with detailed instructions and timing requirements as to how to adapt to conditions where processes, procedures, and automated software systems are not available (if used).”
- “This could include instructions such as an indication that no actions may be required if system conditions have not changed significantly and that previous Contingency analysis or Real-time Assessments may be used in such a situation.”

# Real-Time Monitoring

## TOP (TOP-001-3)

R10: Each TOP shall perform the following as necessary for determining SOL exceedances within its TOP Area:

- Monitor Facilities and the status of SPSs within TOP Area
- Obtain and utilize status, voltages, and flow data for Facilities and the status of SPSs outside TOP Area

## BA (TOP-001-3)

R11: Each BA shall monitor its BA Area, including the status of SPSs that impact generation or Load, in order to maintain generation-Load-interchange balance within its BA Area and support Interconnection frequency.

## RC (IRO-002-4)

R3: Each RC shall monitor Facilities, the status of SPSs, and non-BES facilities identified as necessary by the RC , within its RC Area and neighboring RC Areas to identify any SOL exceedances and to determine any IROL exceedances within its RC Area.

# Real-Time Monitoring - TOP CFR Considerations

## TOP-001-3 10.1 - Each TOP shall perform Real-Time monitoring within its TOP Area

- Within the ERCOT Interconnection, ERCOT monitors Facilities and the status of SPSs.
- Local Control Center TOPs are required to perform Real-Time monitoring of Facilities and the status of SPSs for equipment it has operational control over to determine Real-Time pre-contingency facility-rating and system voltage limit exceedances.

## TOP-001-3 10.2 - Each TOP shall obtain and utilize status, voltages, and flow data outside its TOP Area

- Within the ERCOT Interconnection, ERCOT is required obtain and utilize status, voltages, and flow data for Facilities and the status of SPSs.
- Local Control Center TOPs are not required to obtain and utilize data outside its TOP Area.



# Operating Awareness

## TOP (TOP-001-3)

R8: Each TOP shall inform its RC, known impacted BAs, and known impacted TOPs of its actual or expected operations that result in, or could result in, an Emergency

R15: Each TOP shall inform its RC of actions taken to return the System to within limits when a SOL has been exceeded.

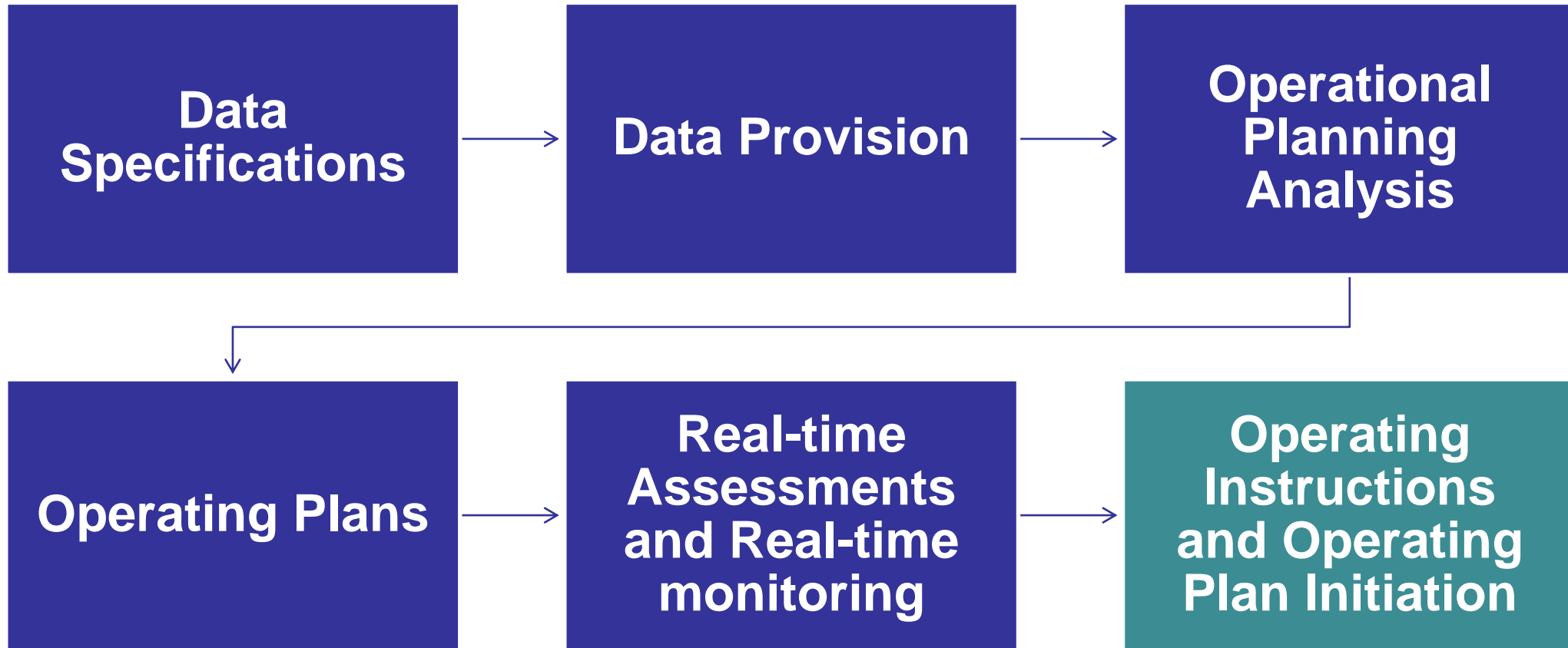
## BA and TOP (TOP-001-3)

R9: Each BA and TOP shall notify its RC and known impacted interconnected entities of all planned outages, and unplanned outages of 30 minutes or more, for telemetering and control equipment, monitoring and assessment capabilities, and associated communication channels between the affected entities.

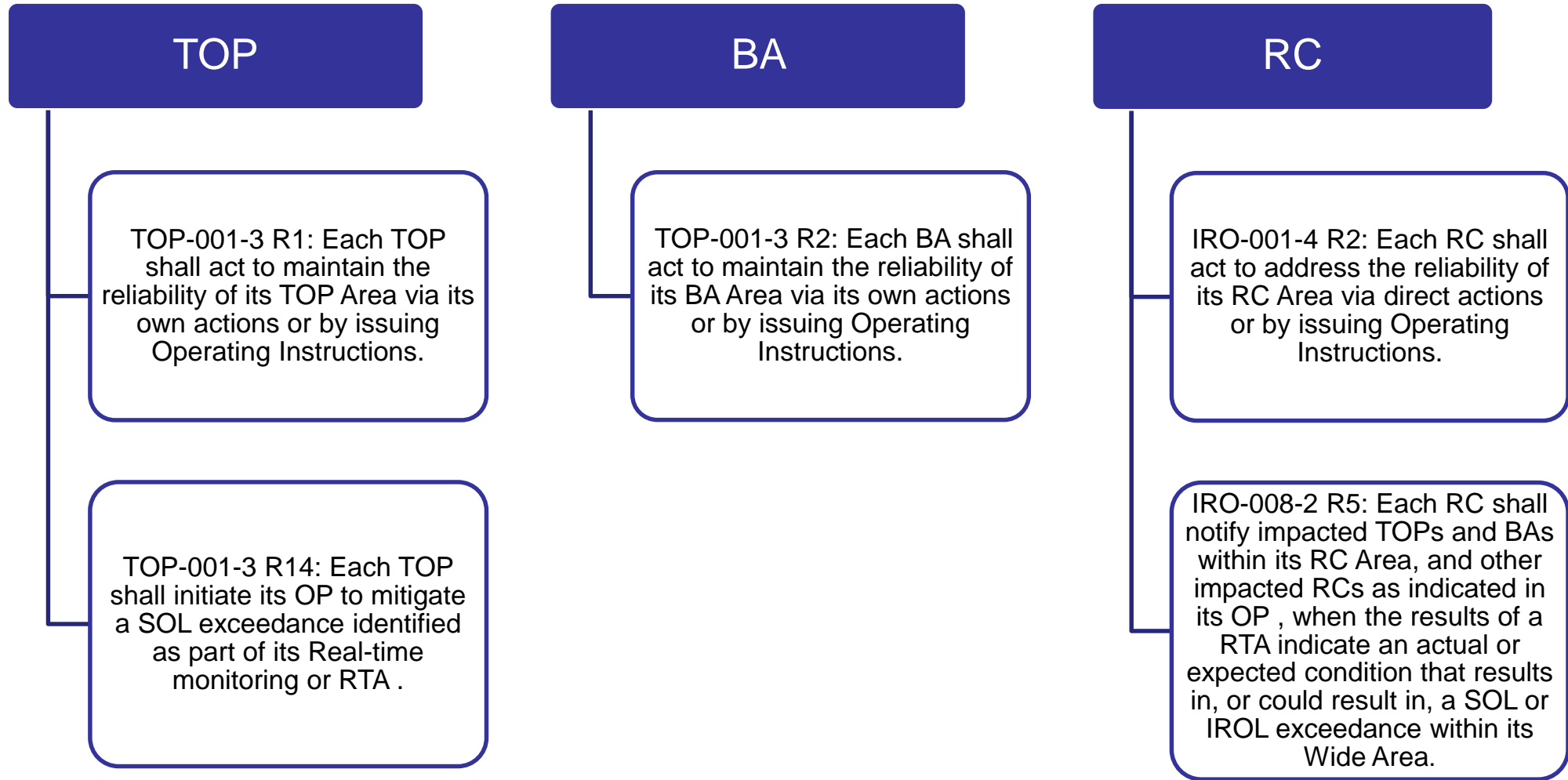
## RC (IRO-008-2)

R6: Each RC shall notify impacted TOPs and BAs within its RC Area, and other impacted RCs as indicated in its OP, when the SOL or IROL exceedance identified in R5 has been prevented or mitigated.

# Key Concepts



# Operating Instruction and Operating Plan Initiation



# Operating Instructions and Operating Plan Initiation - TOP CFR Considerations

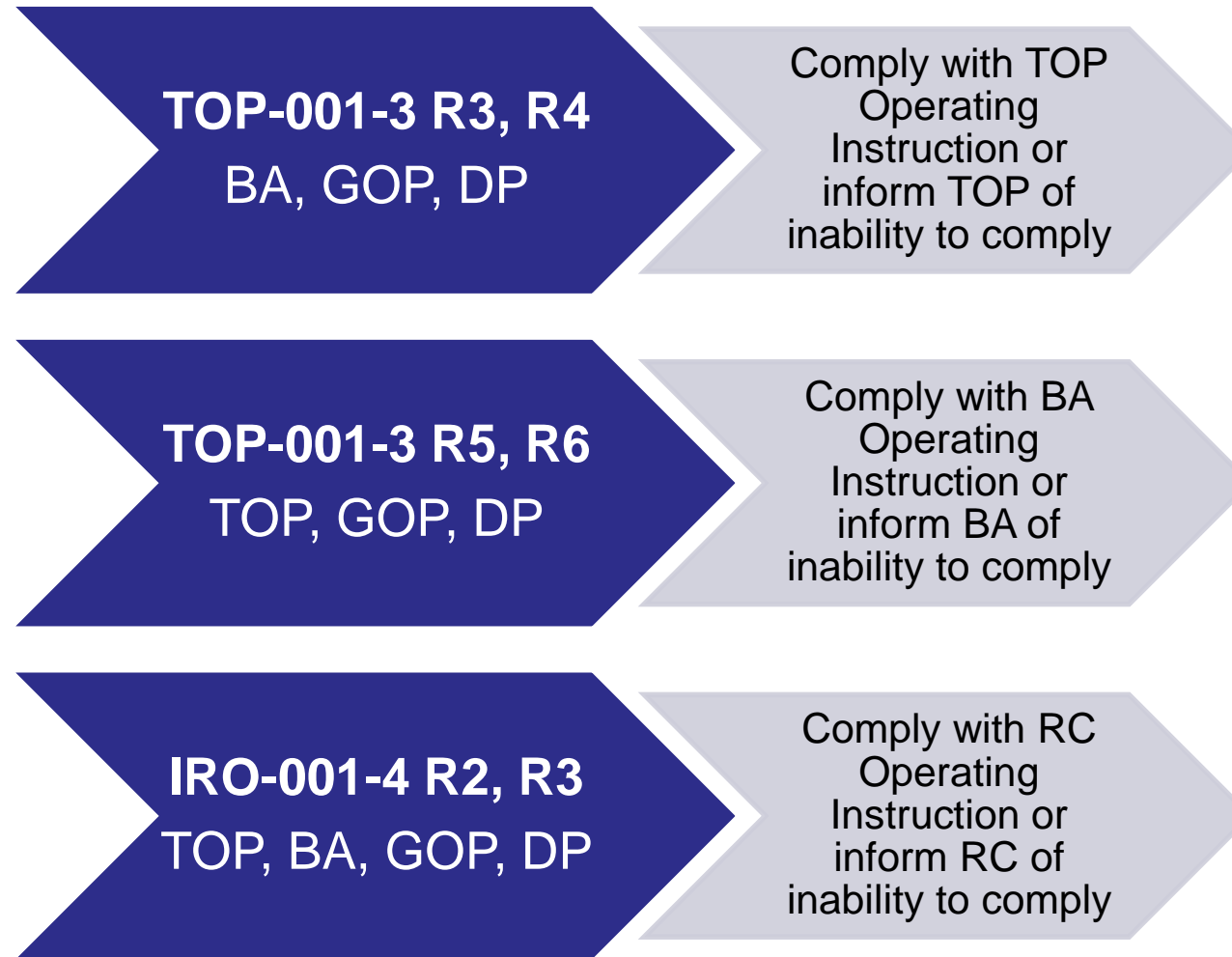
**TOP-001-3 R1: Each Transmission Operator shall act to maintain the reliability of its Transmission Operator Area via its own actions or by issuing Operating Instructions.**

- ERCOT is required to maintain the reliability of the ERCOT Interconnection by issuing Operating Instructions.
- Each Local Control Center TOP is required to act to maintain the reliability of equipment it has operational control over:
  - Via its own actions during emergencies;
  - Via issuing Operating Instructions to generation resources during blackstart situations;
  - By issuing Operating Instructions to direct on-line generation resources with respect to reactive power at all times.

**TOP-001-3 R14: Each Transmission Operator shall initiate its Operating Plan to mitigate a SOL exceedance identified as part of its Real-time monitoring or Real-time Assessment.**

- ERCOT ISO shall initiate its Operating Plan to mitigate a SOL exceedance identified as part of its Real-time monitoring or Real-time Assessment.
- Each Local Control Center shall initiate its Operating Plan to mitigate a real-time pre-contingency facility-rating or system voltage limit exceedance identified as part of its Real-time monitoring.

# Operating Instruction Compliance



## Further Reading

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- [FERC Order 817](#)
- [Project 2014-03 Mapping Document](#)

# Questions?

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