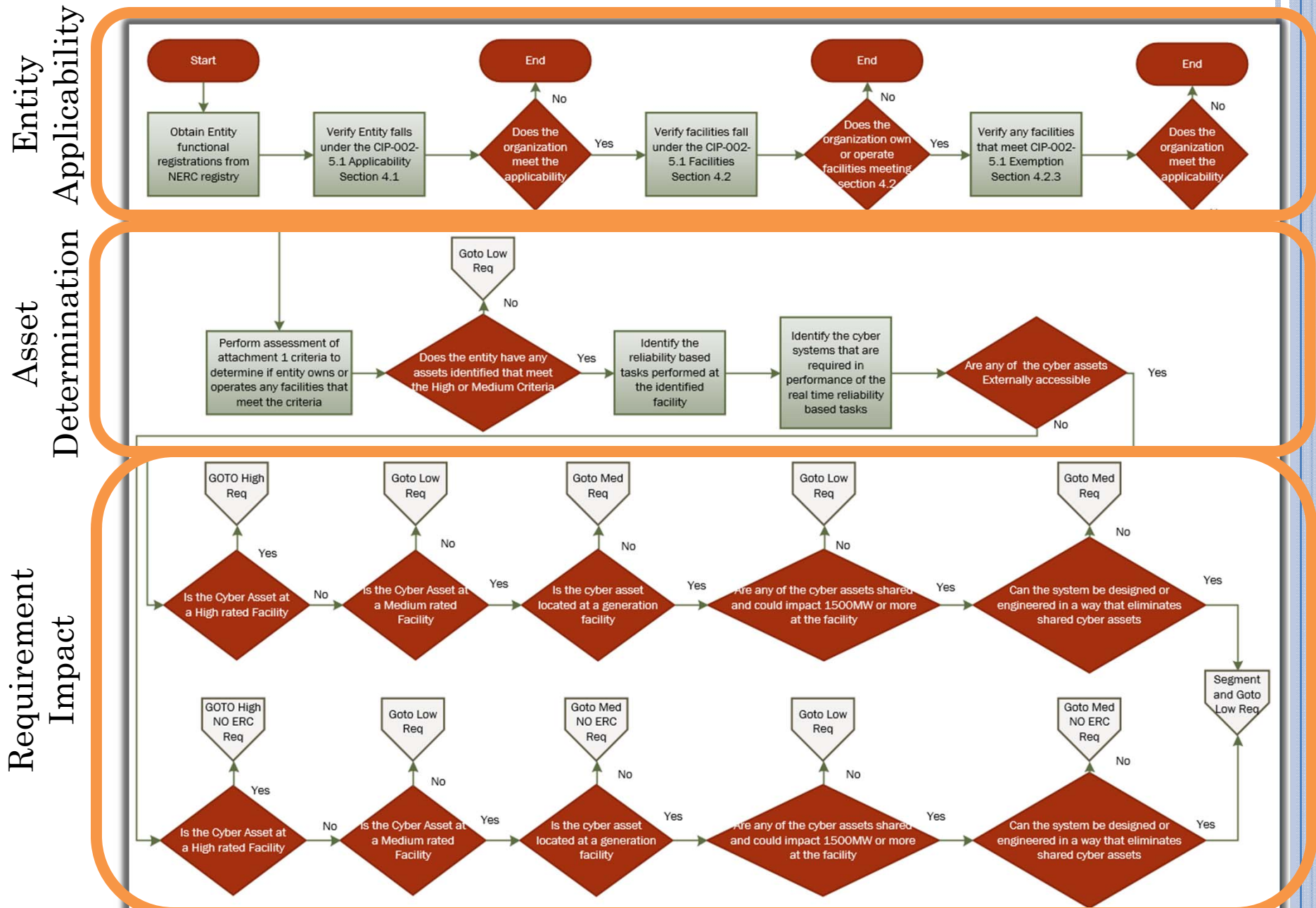




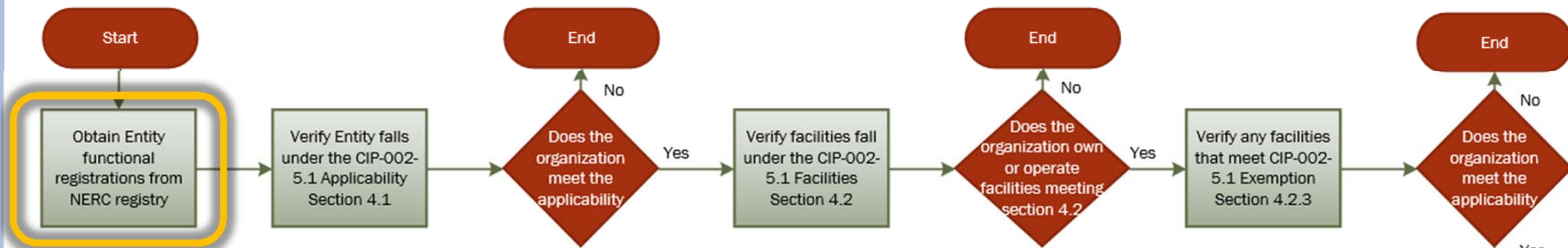
# **SECURITY USERS GROUP DISCUSSION ON NERC CIP V 5**

**September 25, 2014**

# BIG PICTURE



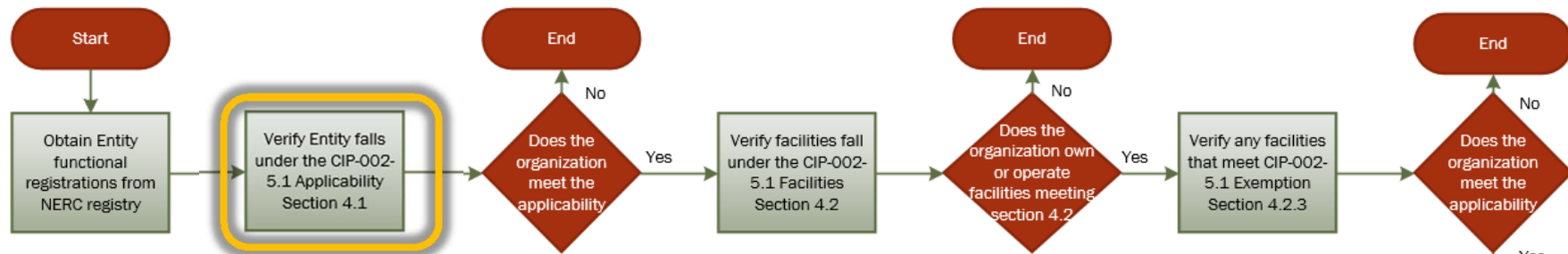
# ENTITY APPLICABILITY



NERC Active Compliance Registry Matrix as of 09/24/2014																			
NCR ID#	Entity Name	Regional Compliance Enforcement Authority	BA	DP	GO	GOP	IA	LSE	PA	PSE	RC	RP	RSG	TO	TOP	TP	TSP		
NCR00068	Seminole Electric Cooperative	FRCC	BA	DP	GO	GOP	IA	LSE	PA	PSE		RP		TO	TOP	TP	TSP		
NCR00069	Shady Hills Power Company, LLC	FRCC			GO	GOP													
NCR10025	Solid Waste Authority of Palm Beach County	FRCC			GO														
NCR00070	Southeastern Power Administration	FRCC								PSE									
NCR00071	Southern Power Company	FRCC			GO	GOP				PSE									
NCR00073	Tallahassee, City of	FRCC	BA	DP	GO	GOP	IA	LSE	PA	PSE		RP		TO	TOP	TP	TSP		
NCR00074	Tampa Electric Company	FRCC	BA	DP	GO	GOP	IA	LSE	PA	PSE		RP		TO	TOP	TP	TSP		
NCR00076	The Energy Authority, Inc.	FRCC								PSE									
NCR10032	US Operating Services Company - Indiantown	FRCC				GOP													
NCR00078	Vandolah Power Company, LLC	FRCC			GO	GOP													
NCR00079	Vero Beach, City of	FRCC		DP				LSE	PA			RP		TO	TOP	TP			
NCR10185	Wheelabrator North Broward	FRCC			GO	GOP													
NCR10184	Wheelabrator S. Broward	FRCC			GO	GOP													
NCR00081	Winter Park, City of	FRCC		DP				LSE											
NCR00959	Alexandria Light & Power	MRO		DP				LSE						TO					
NCR00961	Alliant Energy - East	MRO	BA	DP	GO	GOP		LSE		PSE		RP							
NCR00962	Alliant Energy - West	MRO	BA	DP	GO	GOP		LSE		PSE		RP							
NCR00685	American Transmission Co., LLC	MRO							PA					TO	TOP	TP			

<http://www.nerc.com/pa/comp/Pages/Registration-and-Certification.aspx>

# ENTITY APPLICABILITY



## 4. Applicability:

**4.1. Functional Entities:** For the purpose of the requirements contained herein, the following list of functional entities will be collectively referred to as “Responsible Entities.” For requirements in this standard where a specific functional entity or subset of functional entities are the applicable entity or entities, the functional entity or entities are specified explicitly.

4.1.1. Balancing Authority

4.1.2. Distribution Provider \* Removed Specific Itemized list for this presentation

4.1.3. Generator Operator

4.1.4. Generator Owner

4.1.5. Interchange Coordinator or Interchange Authority

4.1.6. Reliability Coordinator

4.1.7. Transmission Operator

4.1.8. Transmission Owner

[http://www.nerc.com/\\_layouts/PrintStandard.aspx?standardnumber=CIP-002-](http://www.nerc.com/_layouts/PrintStandard.aspx?standardnumber=CIP-002-5.1&title=Cyber%20Security%20E2%80%94BES%20Cyber%20System%20Categorization&jurisdiction=United%20States)

[5.1&title=Cyber%20Security%20E2%80%94BES%20Cyber%20System%20Categorization&jurisdiction=United%20States](http://www.nerc.com/_layouts/PrintStandard.aspx?standardnumber=CIP-002-5.1&title=Cyber%20Security%20E2%80%94BES%20Cyber%20System%20Categorization&jurisdiction=United%20States)

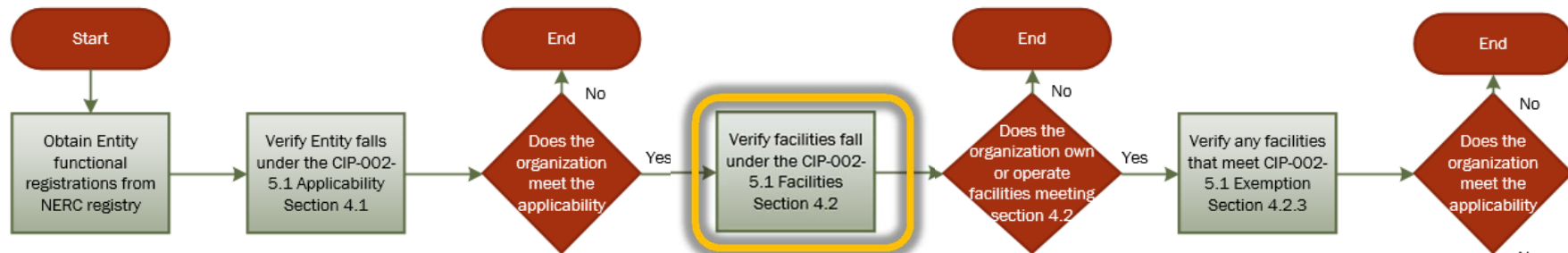


# DISTRIBUTION PROVIDER LISTING

- 4.1.2.1. Each underfrequency load shedding (UFLS) or undervoltage load shedding (UVLS) system that:
  - 4.1.2.1.1. is part of a Load shedding program that is subject to one or more requirements in a NERC or Regional Reliability Standard; and
  - 4.1.2.1.2. performs automatic Load shedding under a common control system owned by the Responsible Entity, without human operator initiation, of 300 MW or more.
- 4.1.2.2. Each Special Protection System or Remedial Action Scheme where the Special Protection System or Remedial Action Scheme is subject to one or more requirements in a NERC or Regional Reliability Standard.
- 4.1.2.3. Each Protection System (excluding UFLS and UVLS) that applies to Transmission where the Protection System is subject to one or more requirements in a NERC or Regional Reliability Standard.
- 4.1.2.4. Each Cranking Path and group of Elements meeting the initial switching requirements from a Blackstart Resource up to and including the first interconnection point of the starting station service of the next generation unit(s) to be started.



# ENTITY APPLICABILITY



**4.2. Facilities:** For the purpose of the requirements contained herein, the following Facilities, systems, and equipment owned by each Responsible Entity in 4.1 above are those to which these requirements are applicable. For requirements in this standard where a specific type of Facilities, system, or equipment or subset of Facilities, systems, and equipment are applicable, these are specified explicitly.

4.2.1. Distribution Provider: One or more of the following Facilities, systems and equipment owned by the Distribution Provider for the protection or restoration of the BES: \* **Removed Specific Itemized list for this presentation**

4.2.2. Responsible Entities listed in 4.1 other than Distribution Providers:  
All BES Facilities.

# DISTRIBUTION PROVIDER LISTING

## **4.2.1.1.** Each UFLS or UVLS System that:

- 4.2.1.1.1.** is part of a Load shedding program that is subject to one or more requirements in a NERC or Regional Reliability Standard; and
- 4.2.1.1.2.** performs automatic Load shedding under a common control system owned by the Responsible Entity, without human operator initiation, of 300 MW or more.

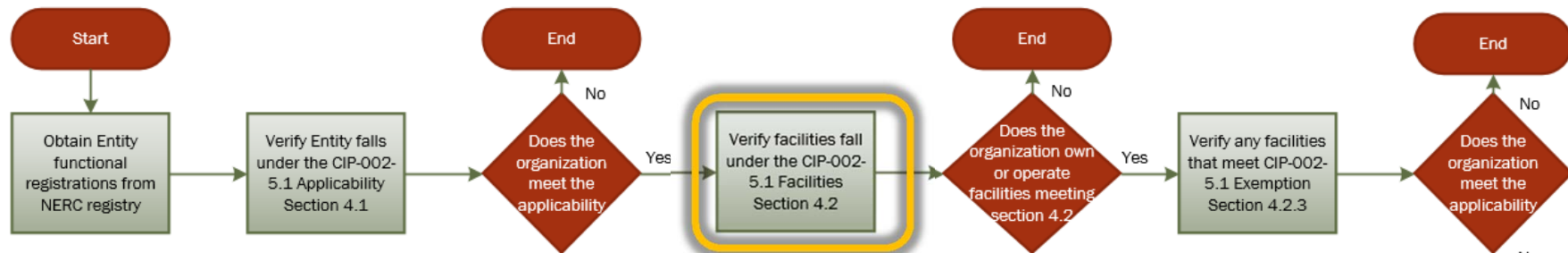
## **4.2.1.2.** Each Special Protection System or Remedial Action Scheme where the Special Protection System or Remedial Action Scheme is subject to one or more requirements in a NERC or Regional Reliability Standard.

## **4.2.1.3.** Each Protection System (excluding UFLS and UVLS) that applies to Transmission where the Protection System is subject to one or more requirements in a NERC or Regional Reliability Standard.

## **4.2.1.4.** Each Cranking Path and group of Elements meeting the initial switching requirements from a Blackstart Resource up to and including the first interconnection point of the starting station service of the next generation unit(s) to be started.



# ENTITY APPLICABILITY



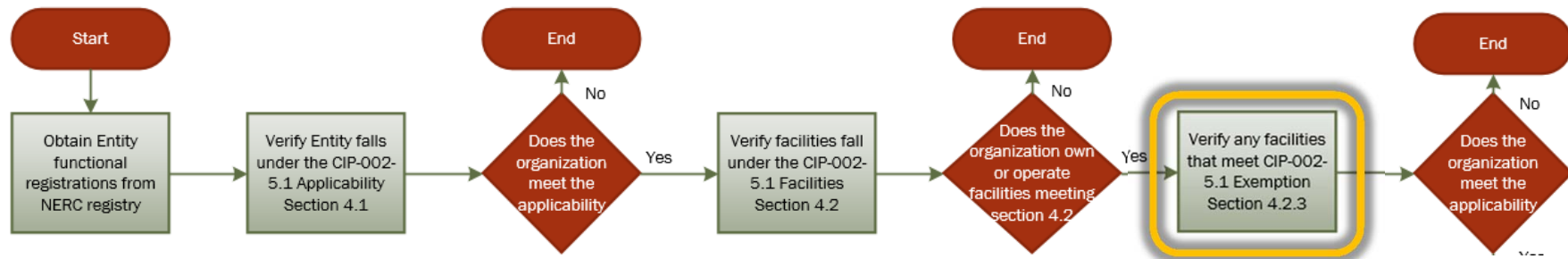
## 4.2.2. Responsible Entities listed in 4.1 other than Distribution Providers: All BES Facilities.

Continent-wide Term	Acronym	BOT Approved Date	FERC Approved Date	Definition
Bulk Electric System [ <a href="#">Archive</a> ]	BES	11/21/2013	3/20/14 (Becomes effective 7/1/2014)	Unless modified by the lists shown below, all Transmission Elements operated at 100 kV or higher and Real Power and Reactive Power resources connected at 100 kV or higher. This does not include facilities used in the local distribution of electric energy.

Continent-wide Term	Acronym	BOT Approved Date	FERC Approved Date	Definition
Facility [ <a href="#">Archive</a> ]		2/7/2006	3/16/2007	A set of electrical equipment that operates as a single Bulk Electric System Element (e.g., a line, a generator, a shunt compensator, transformer, etc.)



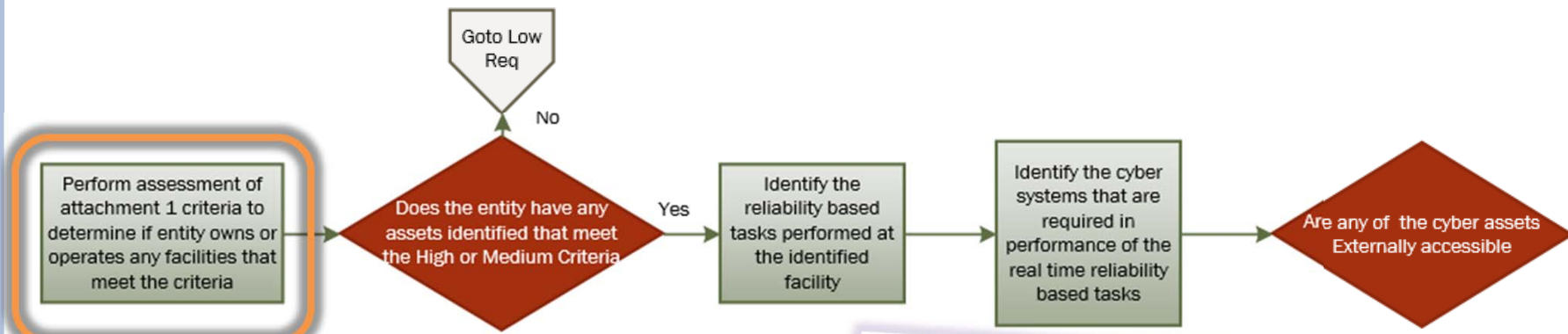
# ENTITY APPLICABILITY



## 4.2.3. Exemptions: The following are exempt from Standard CIP-002-5.1:

- 4.2.3.1. Cyber Assets at Facilities regulated by the Canadian Nuclear Safety Commission.
- 4.2.3.2. Cyber Assets associated with communication networks and data communication links between discrete Electronic Security Perimeters.
- 4.2.3.3. The systems, structures, and components that are regulated by the Nuclear Regulatory Commission under a cyber security plan pursuant to 10 C.F.R. Section 73.54.
- 4.2.3.4. For Distribution Providers, the systems and equipment that are not included in section 4.2.1 above.

# ASSET DETERMINATION



**CIP-002-5 - Attachment 1**  
**Impact Rating Criteria**  
*The criteria defined in Attachment 1 do not constitute stand-alone compliance requirements, but are criteria characterizing the level of impact and are referenced by requirements.*

**1. High Impact Rating (H)**  
 Each BES Cyber System used by and located at any of the following:

- 1.1. Each Control Center or backup Control Center used to perform the functional obligations of the Reliability Coordinator.
- 1.2. Each Control Center or backup Control Center used to perform the functional obligations of the Balancing Authority: 1) for generation equal to or greater than an aggregate of 3000 MW in a single interconnection, or 2) for one or more of the assets that meet criterion 2.3, 2.6, or 2.9.
- 1.3. Each Control Center or backup Control Center used to perform the functional obligations of the Transmission Operator for one or more of the assets that meet criterion 2.2, 2.4, 2.5, 2.7, 2.8, 2.9, or 2.10.
- 1.4. Each Control Center or backup Control Center used to perform the functional obligations of the Generator Operator for one or more of the assets that meet criterion 2.1, 2.3, 2.6, or 2.9.

**2. Medium Impact Rating (M)**  
 Each BES Cyber System, not included in Section 1 above, associated with any of the following:

- 2.1. Commissioned generation, by each group of generating units at a single plant location, with an aggregate highest rated net Real Power capability of the preceding 12 calendar months equal to or exceeding 1500 MW in a single interconnection. For each group of generating units, the only BES Cyber Systems that meet this criterion are those shared BES Cyber Systems that could, within 15 minutes, adversely impact the reliable operation of any combination of units that in aggregate equal or exceed 1500 MW in a single interconnection.
- 2.2. Each BES reactive resource or group of resources at a single location (excluding generation facilities) with an aggregate maximum Reactive Power nameplate rating of 1000 MVAR or greater (excluding those at generation facilities). The only BES Cyber Systems that meet this criterion are those shared BES Cyber Systems that could, within 15 minutes, adversely impact the reliable operation of any combination of resources that in aggregate equal or exceed 1000 MVAR.

**3. Low Impact Rating (L)**  
 BES Cyber Systems not included in Sections 1 or 2 above, associated with any of the following assets and that meet the applicability of the following criteria:

- 3.1. Control Centers and backup Control Centers used to perform the functional obligations of the Reliability Coordinator, the Balancing Authority, the Transmission Operator, or the Generator Operator.
- 3.2. Transmission stations and substations.
- 3.3. Generation resources.
- 3.4. Systems and facilities critical to system reliability, including but not limited to: Cranking Paths and initial switching resources.
- 3.5. Special Protection Systems that support the reliable operation of the system.
- 3.6. For Distribution Providers, Protection Systems that support the reliable operation of the system.

**2.3.** Each generation Facility that its Planning Coordinator designates, and informs the Generator Owner or Operator to avoid an Adverse Reliability Impact in the planning process.

**2.4.** Transmission Facilities operated at 500 kV or higher, the collector bus for a generation plant is not considered part of the generation interconnection facility.

**2.5.** Transmission Facilities that are operating between station or substation, where the station or substation voltages to three or more other Transmission Stations, "aggregate weighted value" exceeding 3000 across the "aggregate weighted value" for a single station or substation, summing the "weight value per line" shown in the each outgoing BES Transmission Line that is connected to the station or substation. For the purpose of this criterion, a generation plant is not considered a Transmission interconnection facility.

Voltage Value of a Line	
less than 200 kV (not applicable)	
200 kV to 299 kV	
300 kV to 499 kV	
500 kV and above	

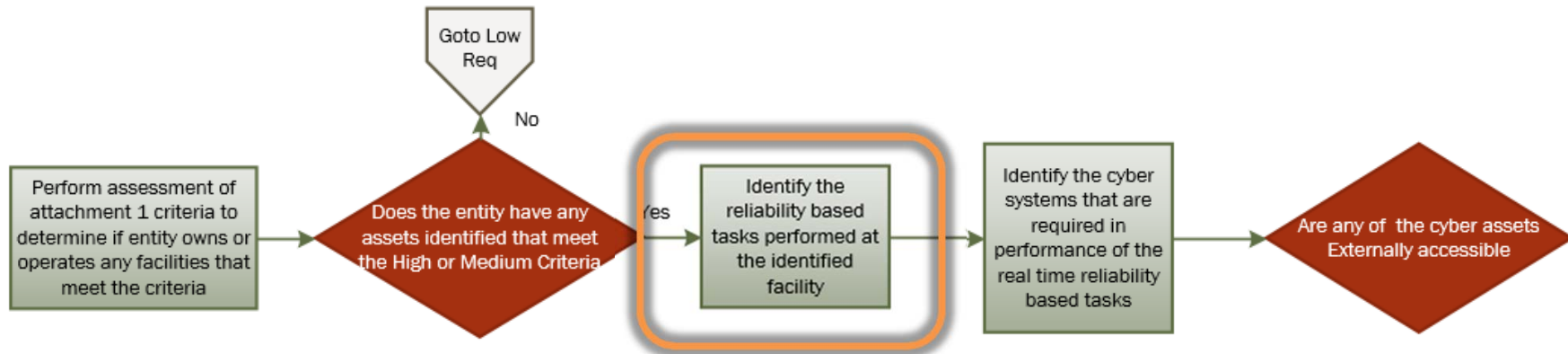
**2.6.** Generation at a single plant location or Transmission substation location that are identified by its Reliability Coordinator, or Transmission Planner as critical to Reliability Operating Limits (IROLs) and their associated Requirements.

**2.7.** Transmission Facilities identified as essential to maintain the reliable operation of the system.

**2.8.** Transmission Facilities, including generation interconnection facilities, that if destroyed, degraded, misused, or otherwise rendered unavailable, would cause one or more BES Elements, or other BES Elements, to be rendered unavailable, would cause one or more IROLs (IROLs) violations for failure to operate, or reduction in one or more IROLs if destroyed, degraded, misused, or otherwise rendered unavailable.

**2.9.** Each Special Protection System (SPS), Remedial Action System, or other BES Element, that if destroyed, degraded, misused, or otherwise rendered unavailable, would cause one or more BES Elements, or other BES Elements, to be rendered unavailable, would cause one or more IROLs (IROLs) violations for failure to operate, or reduction in one or more IROLs if destroyed, degraded, misused, or otherwise rendered unavailable.

# ASSET DETERMINATION



**NERC**  
NORTH AMERICAN ELECTRIC  
RELIABILITY CORPORATION

**Reliability Functional Model**  
Function Definitions and Functional Entities  
Version 5  
Prepared by the Functional Model Working Group

Approved by Standing Committees: December 2009  
Approved by Standards Committee: January 2010  
Approved by Board of Trustees: May 2010

to ensure  
the reliability of the  
bulk power system

November 2009

**Functional Entity — Generator Operator**

**Definition**  
The functional entity that operates generating unit(s) and performs supplying energy and reliability related services.

**Relationships with Other Functional Entities**  
Ahead of Time

1. Provides generation commitment plans to the Balancing Authority.
2. Provides Balancing Authority and Transmission Operator of reliability-related services.
3. Provides operating and availability status of generating unit to Transmission Operators for reliability analysis.
4. Reports status of automatic voltage or frequency regulating Operators.
5. Provides operational data to Reliability Coordinator.
6. Receives reliability analyses from Reliability Coordinator.
7. Receives notice from Purchasing-Selling Entity if Arranged denied.
8. Receives reliability alerts from Reliability Coordinator.
9. Receives notification of transmission system problems from Reliability Coordinator.

**Real Time**

10. Provides Real-time operating information to the Transmission Operator, Balancing Authority.
11. Adjusts real and reactive power as directed by the Balancing Authority.

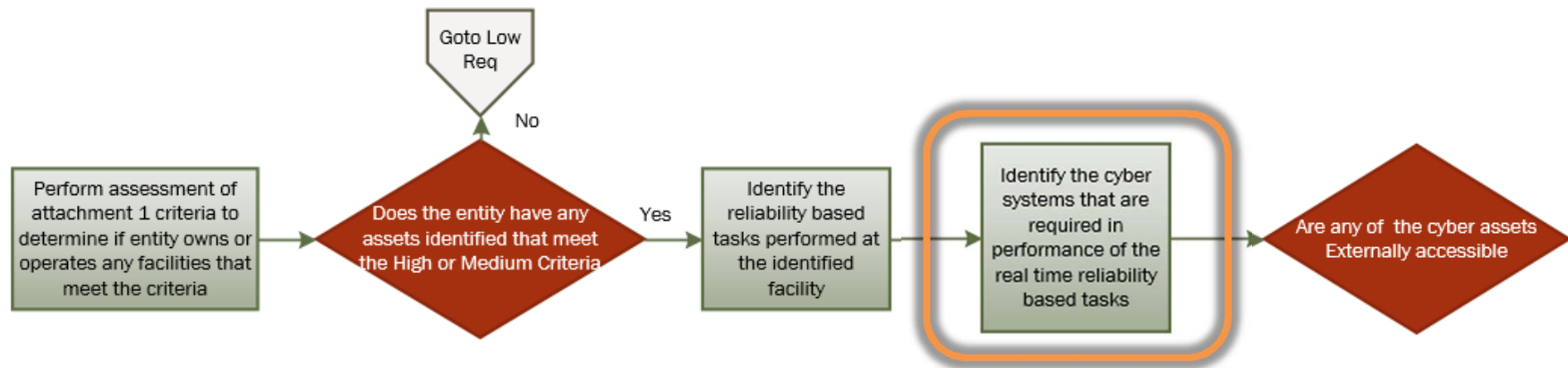
**Functional Entity — Generator**

**Definition**  
The functional entity that owns and maintains generating unit(s).

**Relationships with Other Functional Entities**

1. Provides generator information to the Transmission Operator, Balancing Authority, Transmission Operator, Balancing Authority, Transmission Operator.
2. Provides unit maintenance schedules and unit status to Transmission Operator, Balancing Authority, Transmission Operator.
3. Develops an interconnection agreement with Transmission Operator, Balancing Authority, Transmission Operator.
4. Receives approval or denial of transmission service from Transmission Operator, Balancing Authority, Transmission Operator.
5. Provides reliability related services to Purchasing-Selling Entity if Arranged denied.
6. Reports the annual maintenance plan to the Reliability Coordinator and Transmission Operator.
7. Revises the generation maintenance plans as directed by the Reliability Coordinator.

# ASSET DETERMINATION

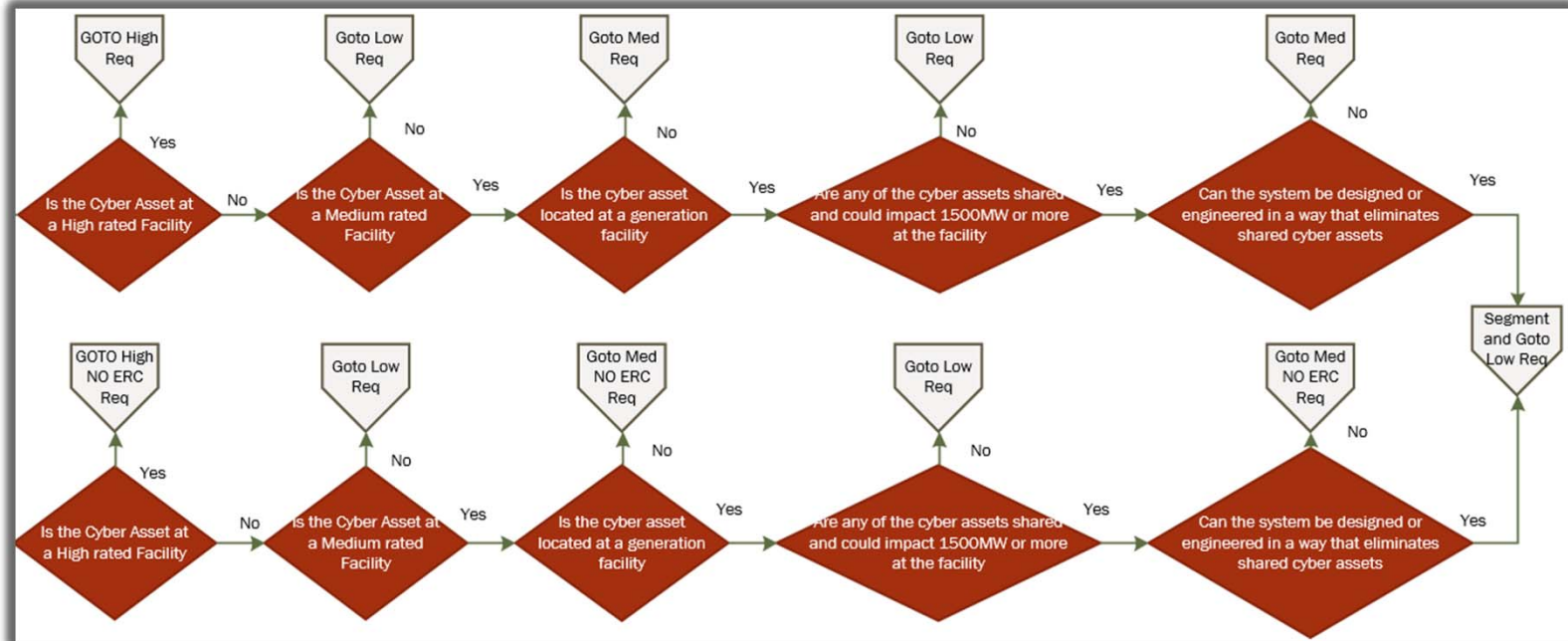


- Interviews with SMEs to identify cyber systems that are used to perform real time reliability tasks
- Utilize system documentation and review system configuration to develop logic diagrams





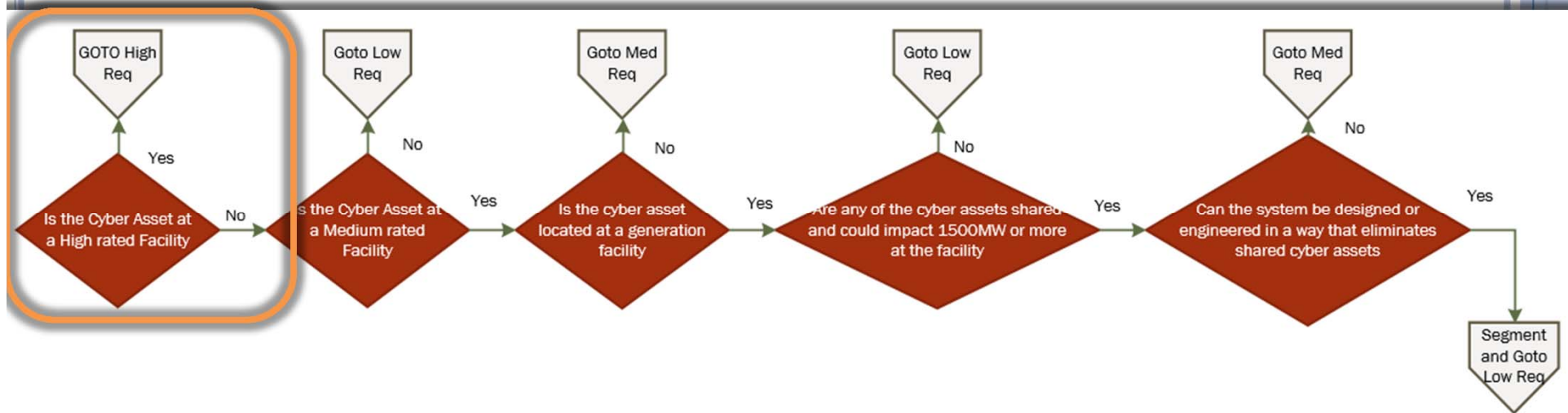
# REQUIREMENT IMPACT



The only difference between these two paths is whether the identified cyber asset has External Routable Connectivity



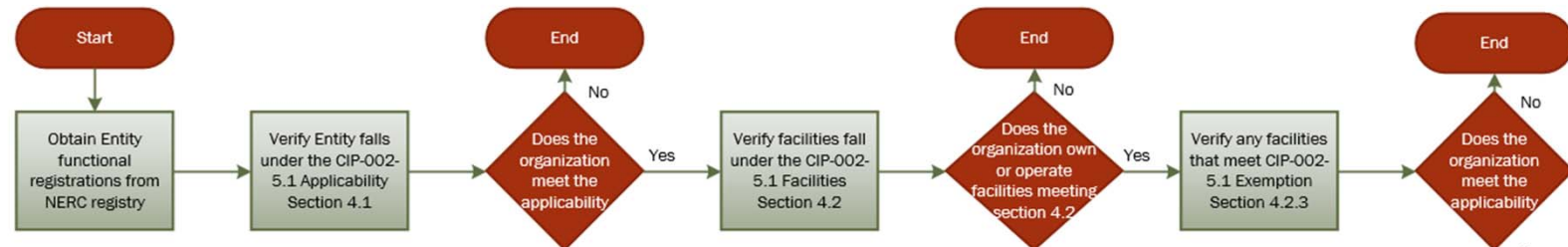
# REQUIREMENT IMPACT



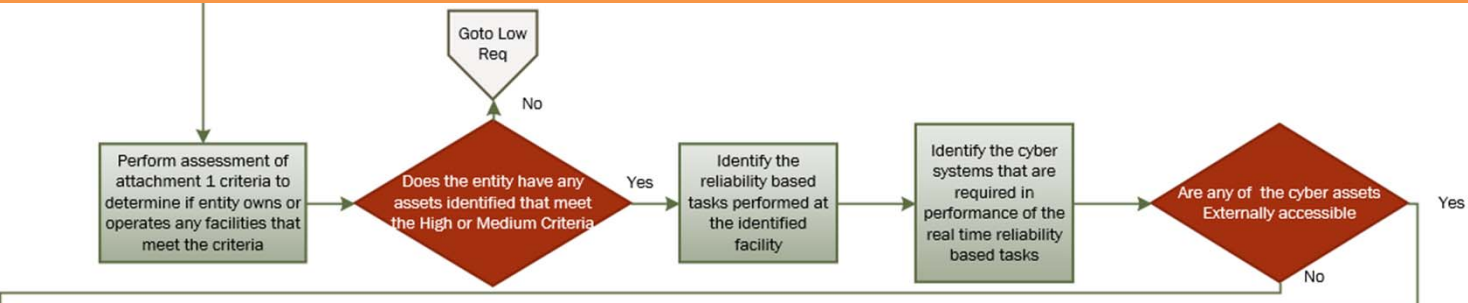
\* More to come on Requirement Mapping

# BIG PICTURE

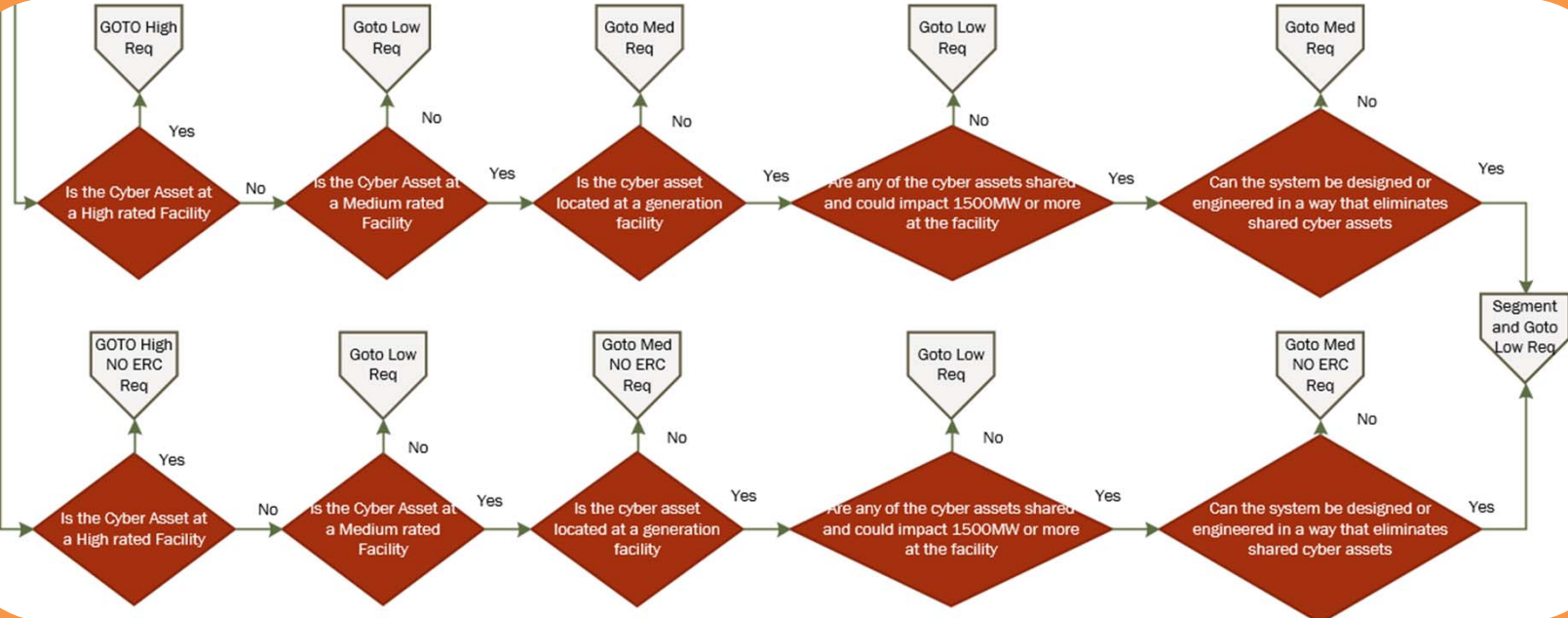
Entity  
Applicability



Asset  
Determination



Requirement  
Impact

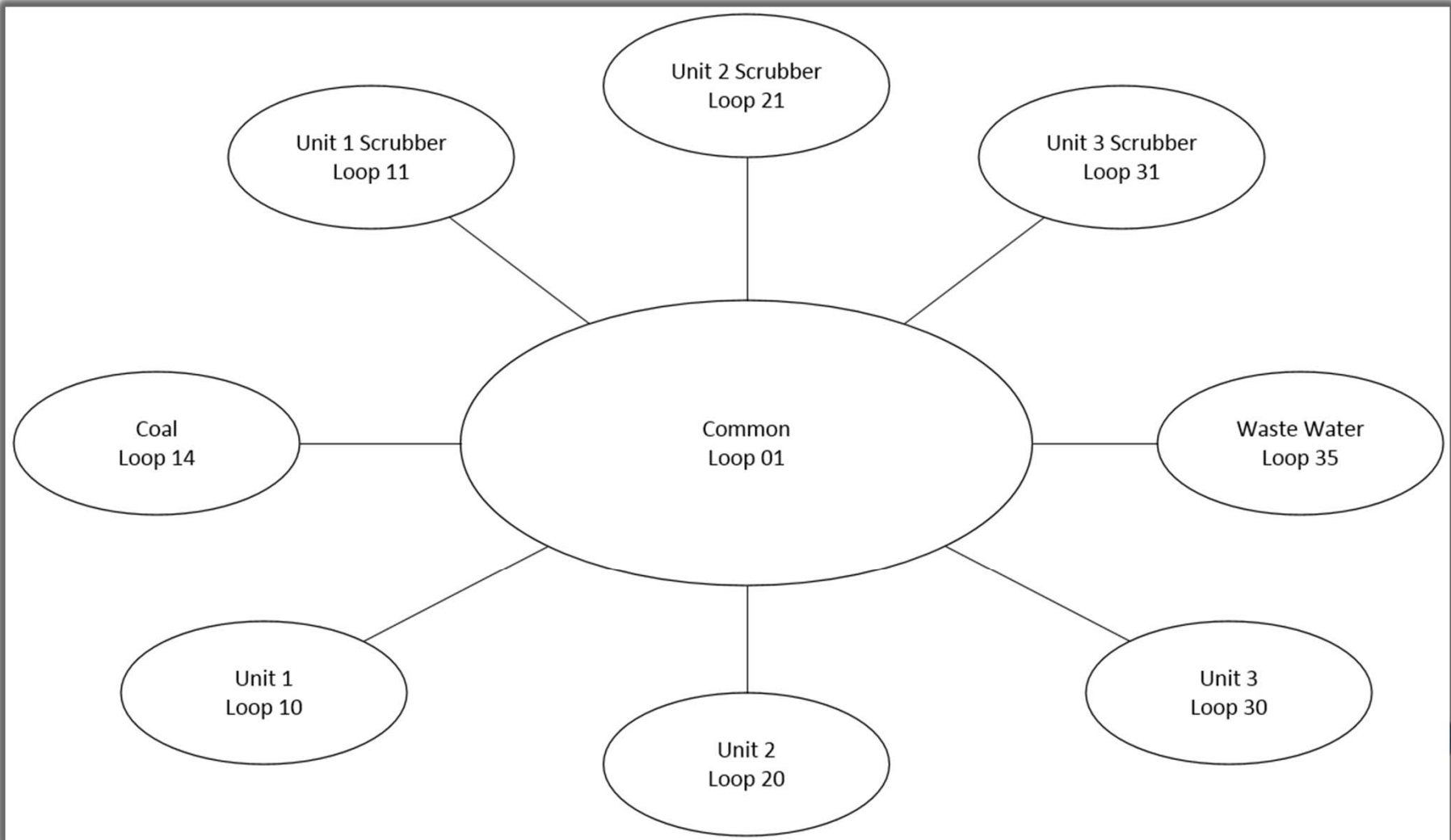


## SEGMENTATION CONCEPT

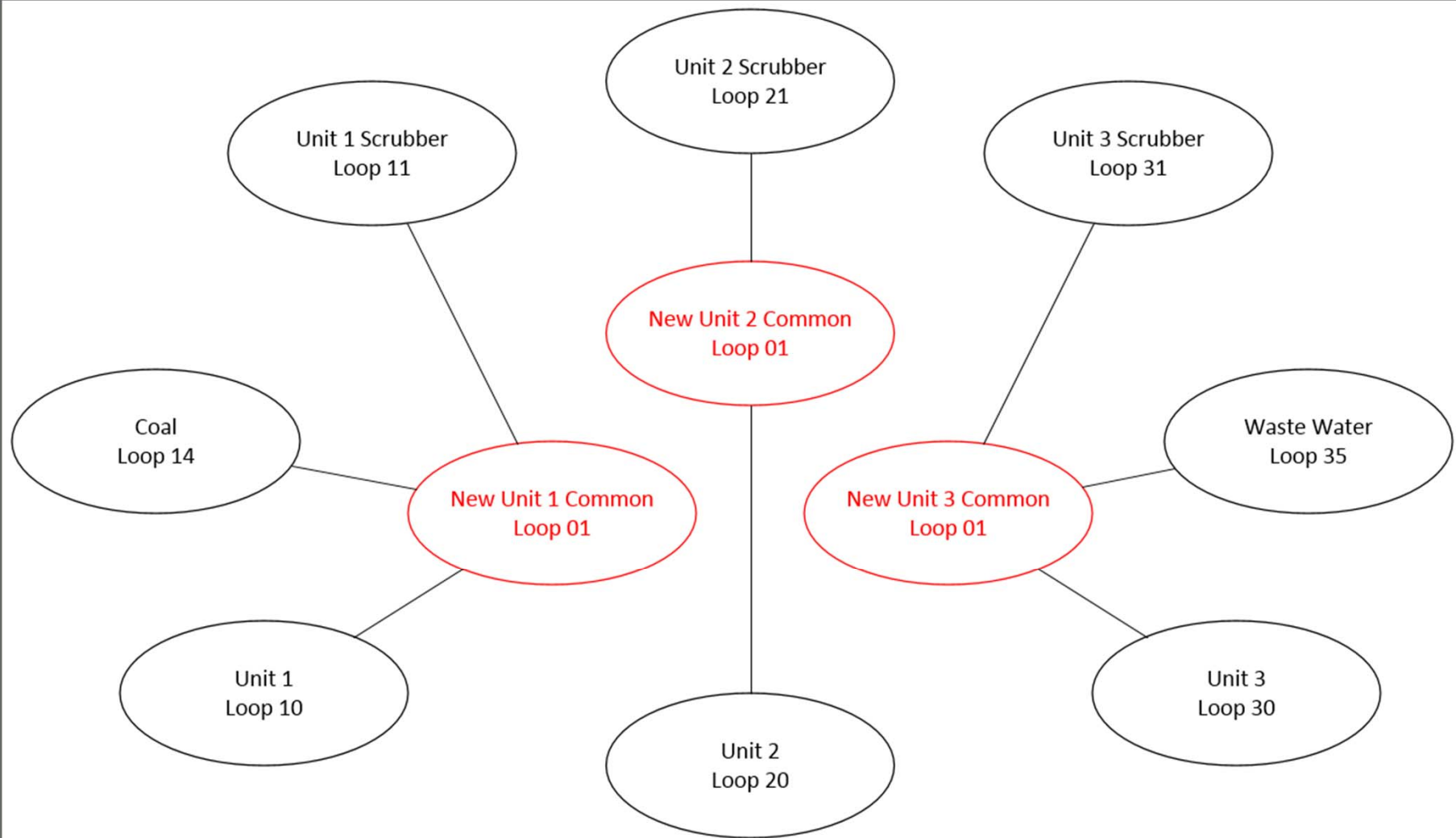
- Generation aggregate of 1500MW or more
- Multiple units with shared cyber assets
- Segment to eliminate any shared cyber assets that could impact 1500MW or more
- May not be ideal at some facilities
- Needs to address Operations Level assets and Control Level assets



# SHARED LOOP



# SEGMENTED LOOP





## OCT 23 CIP DISCUSSION PART 2

- Cyber asset grouping approaches
- Requirements walk through for ERC vs non ERC
- Open discussion on cyber asset, programmable, 15 min criteria, and TFE's



