

# System Operations Division Identify Need for Constraints

## Document Location Map

- 📁 Level 3 Document User Domain Procedures
  - 📁 Outages and Contraints (OC) /Security Assessment
    - 📄 PR-OC-208 Identify Need for Constraints

Document Status: **Approved**

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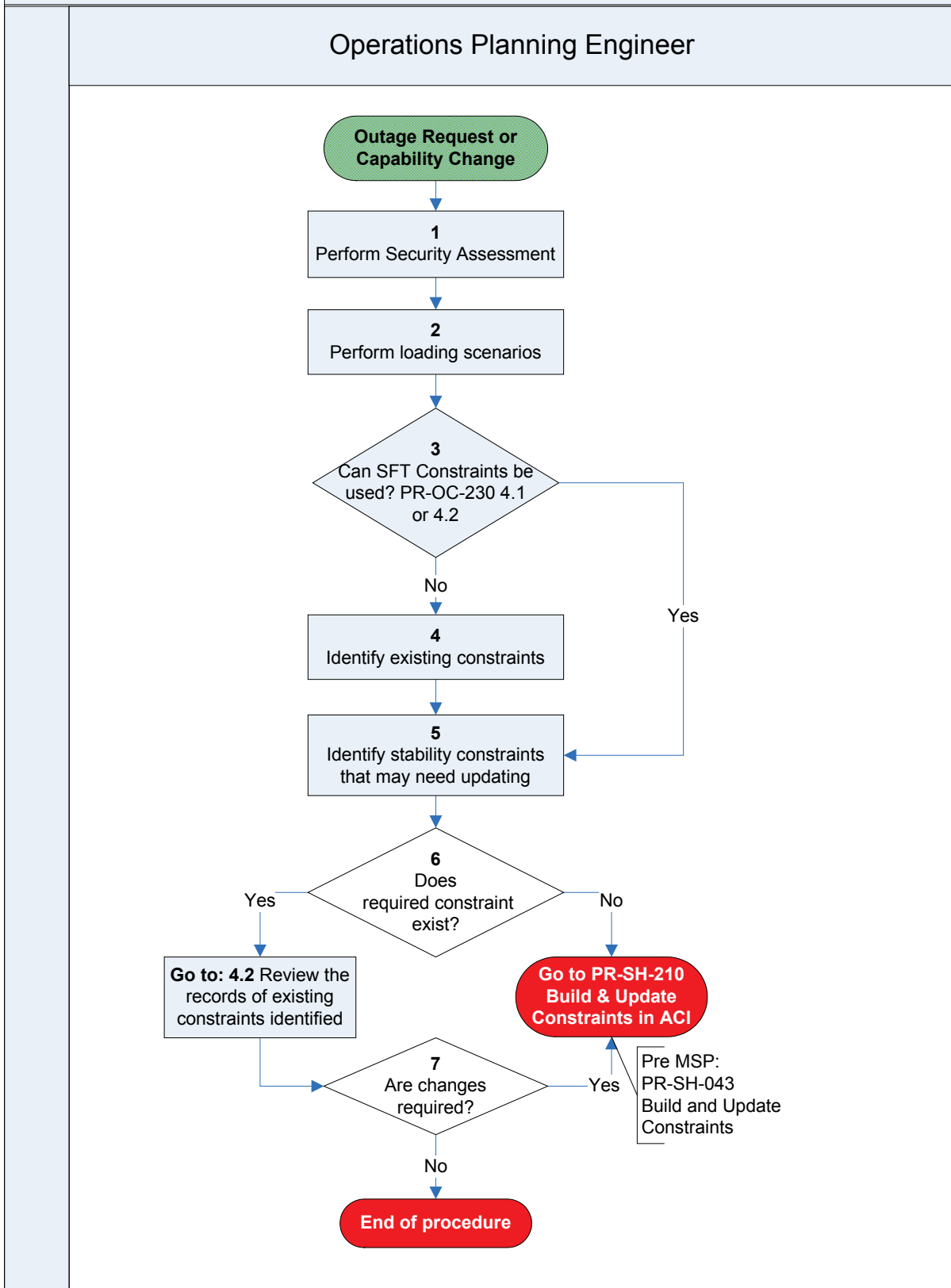
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## Revision History

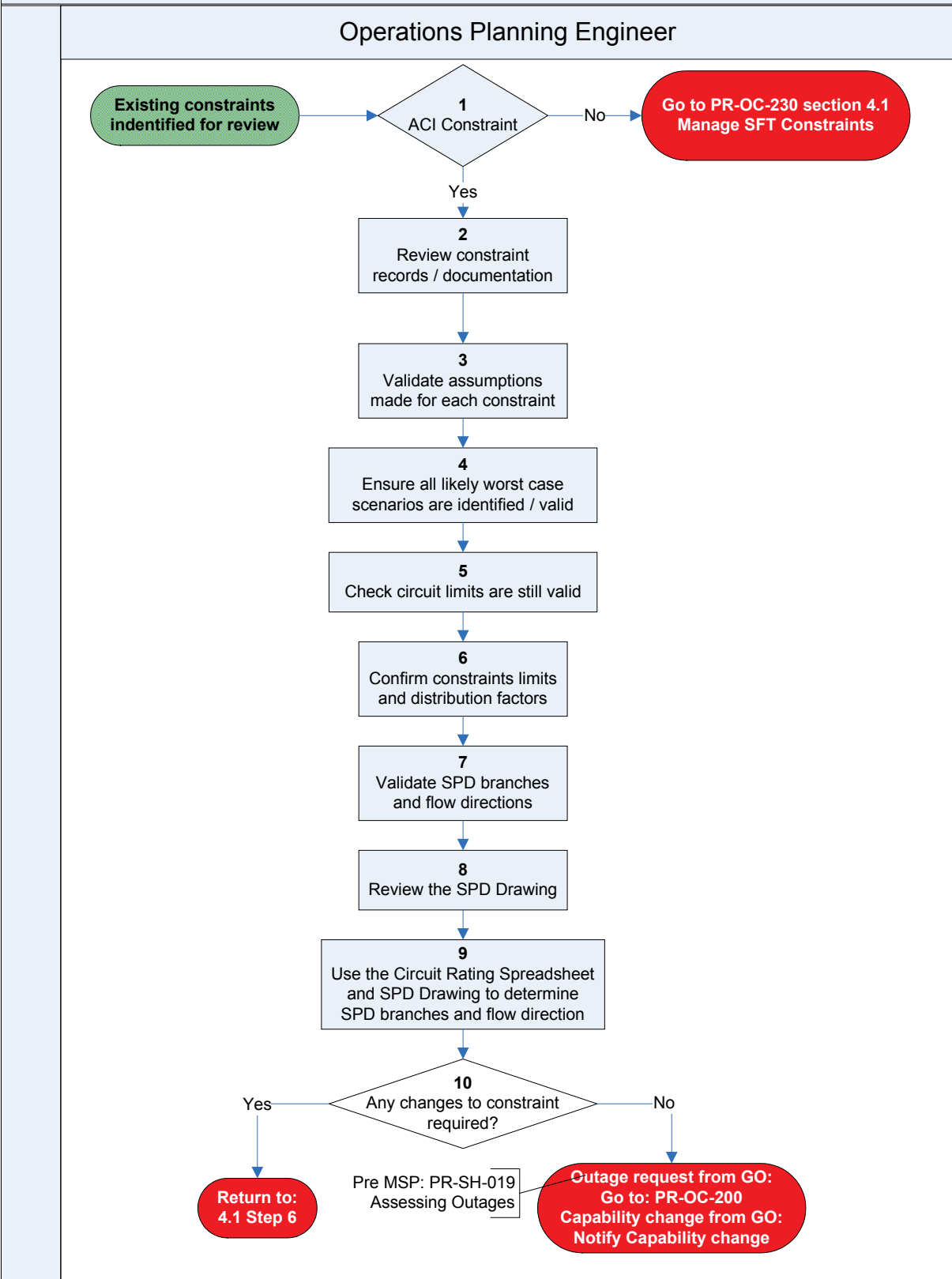
Revision	Date	Change	Section
V01	23/3/2009	Supersedes PR-SH-042. Re-formatted and re-worked.	
V02	11/2/11	SFT Update	
		update flowchart	4.1
		update flowchart	4.2
		add step	4.1
		add step	4.2

# 1 Procedure Summary Diagram

## (4.1) Determine the Need to Build or Update Constraints



**(4.2) Review the records of existing constraints identified**



NOTE – The diagram above shows how the process in the Identify Need for Constraints; document number PR-OC-208, supports the Outages and Constraints (OC) Macro Process of the DMS.

## 2 Purpose

**Purpose and Objectives** This document provides the procedures for performing a security assessment.  
It also provides a list of the triggers that would cause you to examine existing constraints in the Constraints Database (see Appendix 5.1).

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**External Policy/ Rules & Regulations**

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**Related Internal Policies, Processes and Procedures** The following documents will provide useful additional and background information.

**GL-OC-202** Security Constraints Development Methodology.doc

**PR-OC-204** Security Constraint Process Overview.doc

**PR-OC-213** Conduct Peer Review of Security Constraints.doc

**PR-OC-215** Determine Conductor Thermal Characteristics for use in Constraints Development.doc

**PR-OC-218** Release Constraint to MCL and Update Bundle.doc

**UG-SD-021** ACI Database Users Guide

**PR-OC-200** Outage Assessment Overview

**Post MSP Procedures**

**PR-OC-210** Build and Update Constraints in ACI

**PR-OC-219** Constraint Bundling Procedure.doc

**Pre MSP Procedures**

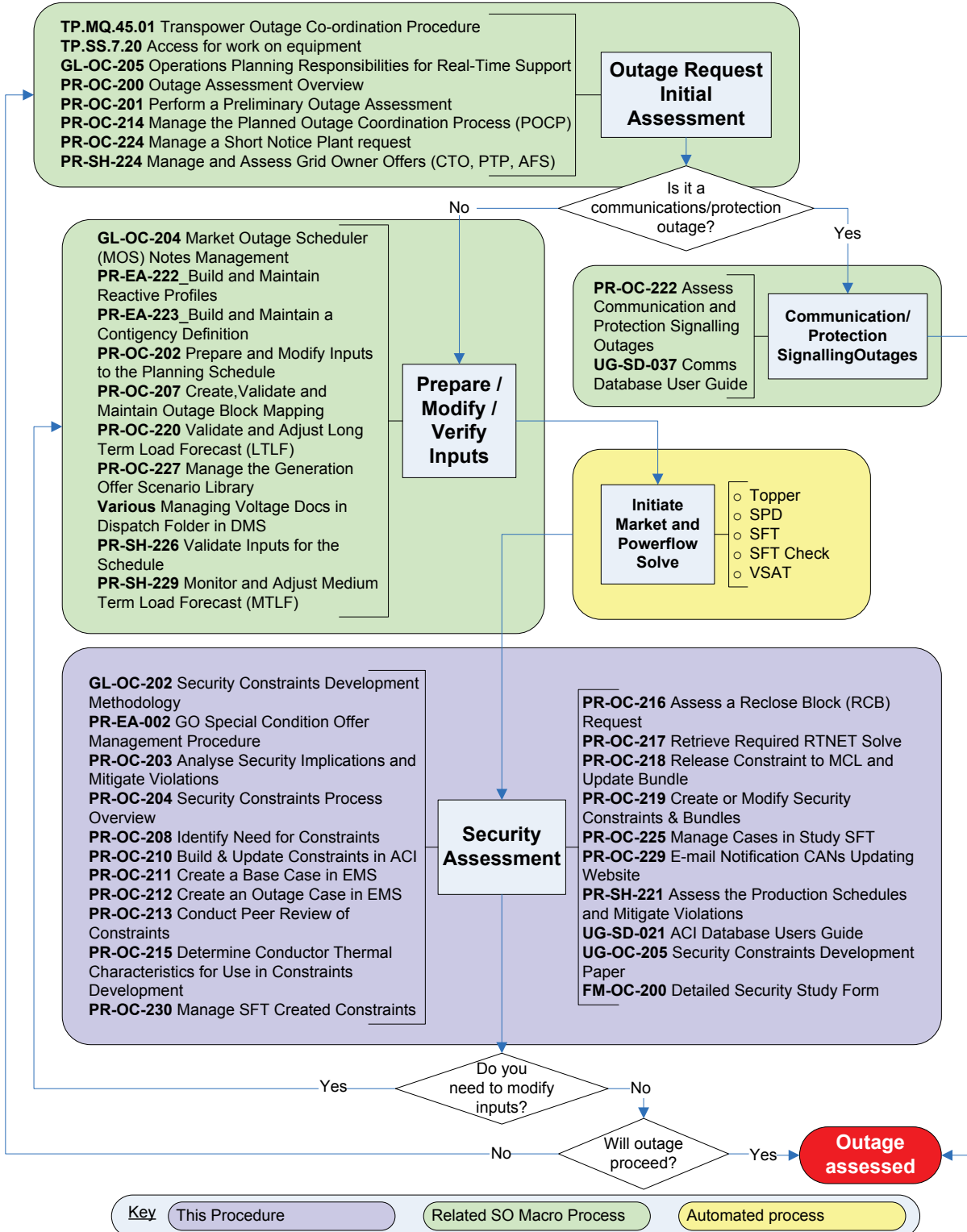
**PR-SH-043** Build and Update Constraints

**PR-SH-019** Assessing Outages

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### 3 Related Procedure/Processes

#### Outage Assessment Process Documents



## 4 Procedures

### 4.1 Determine the Need to Build or Update Constraints

<b>Inputs</b>	You have received one of the inputs or triggers outlined in Appendix 5.1.
<b>Outputs</b>	You have identified existing constraints that need to be reviewed/updated or decided that new constraints need to be built.
<b>Responsibilities</b>	Operations Planning Engineer.
<b>Instructions</b>	

Step	Action						
1	Perform a security assessment for possible and likely worst generation scenarios through: <ul style="list-style-type: none"> <li>▪ power flow</li> <li>▪ contingency analysis</li> <li>▪ voltage stability analysis</li> <li>▪ dynamic stability analysis</li> </ul>						
2	Perform loading scenarios for the affected area for both summer and winter. Identify possible steady state loading violations or unmanageable single contingent events. Consider all likely worse case scenarios. <p><b>Examples:</b></p> <ul style="list-style-type: none"> <li>▪ peak and trough load</li> <li>▪ low or high generation scenarios</li> <li>▪ high DC north or DC south.</li> </ul>						
3	Can SFT constraints be used? Refer to PR-OC-230 4.1 or 4.2 <table border="1" style="width: 100%; margin-top: 5px;"> <thead> <tr> <th>If</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>Go to step 5</td> </tr> <tr> <td>No</td> <td>Go to step 4</td> </tr> </tbody> </table>	If	Then	Yes	Go to step 5	No	Go to step 4
If	Then						
Yes	Go to step 5						
No	Go to step 4						
4	Identify all existing constraints with the affected SPD branches in the Constraint Database. Do not limit your review to outage constraints. The constraint you require may be covered by an existing permanent constraint. <p><b>Note:</b> If the affected SPD branch has a parallel branch (e.g. ARI-HAM1 and ARI-HAM2), identify all constraints that contain the parallel branch as well. These may also need to be updated if there is a capability change in one of the branches.</p>						
5	Identify any stability constraints that may need to be updated if a commissioning, decommissioning, or impedance change is involved. <p><b>Reference:</b> UG-SD-021 ACI Database Users Guide</p>						
6	Does the required constraint exist? <table border="1" style="width: 100%; margin-top: 5px;"> <thead> <tr> <th>If</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>go to <b>4.2 Review the Records of Existing Constraints Identified</b></td> </tr> <tr> <td>No</td> <td>go to [pre MSP] <b>PR-SH-043 Build and Update Constraints</b>   [post MSP] <b>PR-OC-210 Build and Update Constraints in ACI</b>.</td> </tr> </tbody> </table>	If	Then	Yes	go to <b>4.2 Review the Records of Existing Constraints Identified</b>	No	go to [pre MSP] <b>PR-SH-043 Build and Update Constraints</b>   [post MSP] <b>PR-OC-210 Build and Update Constraints in ACI</b> .
If	Then						
Yes	go to <b>4.2 Review the Records of Existing Constraints Identified</b>						
No	go to [pre MSP] <b>PR-SH-043 Build and Update Constraints</b>   [post MSP] <b>PR-OC-210 Build and Update Constraints in ACI</b> .						



Step	Action								
7	<table border="1"><tr><td colspan="2">Are changes required?</td></tr><tr><th>If</th><th>Then</th></tr><tr><td>Yes</td><td>go to [pre MSP] <b>PR-SH-043</b> <i>Build and Update Constraints</i>   [post MSP] <b>PR-OC-210</b> <i>Build and Update Constraints in ACI</i>.</td></tr><tr><td>No</td><td>End of procedure.</td></tr></table>	Are changes required?		If	Then	Yes	go to [pre MSP] <b>PR-SH-043</b> <i>Build and Update Constraints</i>   [post MSP] <b>PR-OC-210</b> <i>Build and Update Constraints in ACI</i> .	No	End of procedure.
Are changes required?									
If	Then								
Yes	go to [pre MSP] <b>PR-SH-043</b> <i>Build and Update Constraints</i>   [post MSP] <b>PR-OC-210</b> <i>Build and Update Constraints in ACI</i> .								
No	End of procedure.								

## 4.2 Review the Records of Existing Constraints Identified

<b>Inputs</b>	You have identified existing constraints that need to be reviewed/updated or decided that new constraints need to be built.
<b>Outputs</b>	You have decided whether changes to the constraint are required.
<b>Responsibilities</b>	Operations Planning Engineer
<b>Instructions</b>	

Step	Action						
1	Review the constraint records and/or documentation for identified constraints. <b>Note:</b> The ACI constraints database was started in July 2004. The database contains all information pertaining to the constraint, thus eliminating the need for a constraint document. Constraints created prior to this date required separate word documents. The old constraint documents are in the Constraint Document Filing Directory <a href="#">\\nifs1\nipub\Opsplanner\Constraints\</a>						
2	ACI constraint? <table border="1"> <thead> <tr> <th>If</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>Yes</td> <td>Go to step 2</td> </tr> <tr> <td>No</td> <td>Go to PR-OC-230 Manage SFT Constraints section 4.1</td> </tr> </tbody> </table>	If	Then	Yes	Go to step 2	No	Go to PR-OC-230 Manage SFT Constraints section 4.1
If	Then						
Yes	Go to step 2						
No	Go to PR-OC-230 Manage SFT Constraints section 4.1						
3	Validate the assumptions made for each of the constraints.						
4	Determine if all likely worse case scenarios have been identified or are still valid.						
5	Check if the circuit limits are still valid. Refer to the Circuit Rating Spreadsheet for confirmation <a href="#">\\nifs1\nipub\BCP_backup\SO Circuit and Transformer Ratings.xls</a>						
6	Confirm the constraints limits and distribution factors. Carry out power flow for confirmation, if necessary.						
7	Confirm SPD branches and flow directions are valid. To identify the SPD branch ID and flow direction, refer to the Circuit Rating Spreadsheet.						
8	Review the PDF file called "SpdLocator.dwg.pdf" stored on the Transpower intranet at: <a href="http://intranet.transpower.co.nz/upload/market_services/SpdLocator.dwg.pdf">http://intranet.transpower.co.nz/upload/market_services/SpdLocator.dwg.pdf</a> . This file contains the SPD drawing.						
9	Read the topic 'Identifying SPD branches representing underlying circuits' in the document 'Build and Update Constraints' for guidelines on how to determine the SPD branches and flow direction using the Circuit Rating spreadsheet and the SPD drawing.						



Step	Action	
10	Are changes to the constraint required?	
	<b>If</b>	<b>Then</b>
	Yes	return to <b>4.1</b> Step 7
	No	use the table below to decide what to do next:
	<b>If the trigger was ...</b>	<b>then ...</b>
	an outage request from an asset owner	Update FM-OC-200 Detailed security Study. <b>Reference:</b> [pre MSP] <b>PR-SH-019 Assessing Outages</b>   [post MSP] <b>PR-OC-200 Outage Assessment Overview</b> .
a capability change from an asset owner	Email Realtime and Market Services of final capability change notification.	

## 5 Appendix

### 5.1 Triggers for Changing Transmission Security Constraints

Factor	Operations Planning are notified by ...
<b>Change of transmission capacity, impedance, or operating policy</b>	
<ul style="list-style-type: none"> <li>▪ Commissioning or decommissioning of equipment or circuits</li> <li>▪ Review of existing ratings</li> <li>▪ Errors identified in existing ratings</li> </ul>	Grid Owner Gatekeeper through the Equipment Change Notification Process
Change of operating policy.	System Operator management
<b>Change of generation capacity</b>	
<ul style="list-style-type: none"> <li>▪ Connection of new generation</li> <li>▪ Re-rating of existing generation</li> </ul>	System Operator mailbox
<b>Change of load or load growth</b>	
General load growth	Operations Planning Engineer - As estimated from historical SCADA/GOS Loading Tool or metering data as obtained from GERM/Avalon
Addition, shifting or termination of loads	<ul style="list-style-type: none"> <li>▪ Account Managers</li> <li>▪ Grid Owner Gatekeeper</li> </ul>
<b>Change of operation configuration</b>	
Moving of system splits	<ul style="list-style-type: none"> <li>▪ Operations Planning</li> <li>▪ NCC</li> <li>▪ Grid owner gatekeeper</li> </ul>
<ul style="list-style-type: none"> <li>▪ Installation of special protection schemes</li> <li>▪ Application of flexible AC transmission system (FACTS) devices</li> </ul>	Grid Owner Gatekeeper
<b>Grid outages</b>	
This may be planned or unplanned outages	Entered into PROMS by Field Support Planners, Operations Coordinators and Contractors through Outage Coordination Process
<b>Change to the SPD model</b>	
This may be due to a change to how SPD model is represented such as: <ul style="list-style-type: none"> <li>▪ Renaming of branches</li> <li>▪ Re-configuration of buses or branches</li> <li>▪ Change to the modelling of loads or generation</li> </ul>	Market Services Analyst
<b>Violations in real time operation</b>	
These are the real time unmanageable contingencies	<ul style="list-style-type: none"> <li>▪ Security Coordinator from real time operations</li> <li>▪ Operations Planning Engineer from event log and system reports</li> </ul>

## 6 Document Information

### 6.1 Metadata

#### Document ID Information

<i>Document ID number:</i>	PR-OC-208
<i>Document Title:</i>	Identify Need for Constraints
<i>Document Type:</i>	Procedure
<i>Issue no: (version)</i>	V02
<i>Document Status:</i>	Approved
<i>Severity of Consequences:</i>	Moderate
<i>Frequency of use</i>	Daily
<i>Level of Risk:</i>	Very High

#### DMS Structure

<i>DMS Level:</i>	Level 3 Document User Domain Procedures
<i>Macro-Process:</i>	Outages and Constraints (OC)
<i>Process:</i>	Security Assessment
<i>Sub directory(s):</i>	Not Used
<i>Document Complexity Rating</i>	3W

#### Document Control

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