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LSS Equipment Requiring Repair

Final Report

August 8, 2008

Black Belt: Redacted

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Attachments:

- **Process Map**
- **Instructions**
- **DO Guideline**

Project Status

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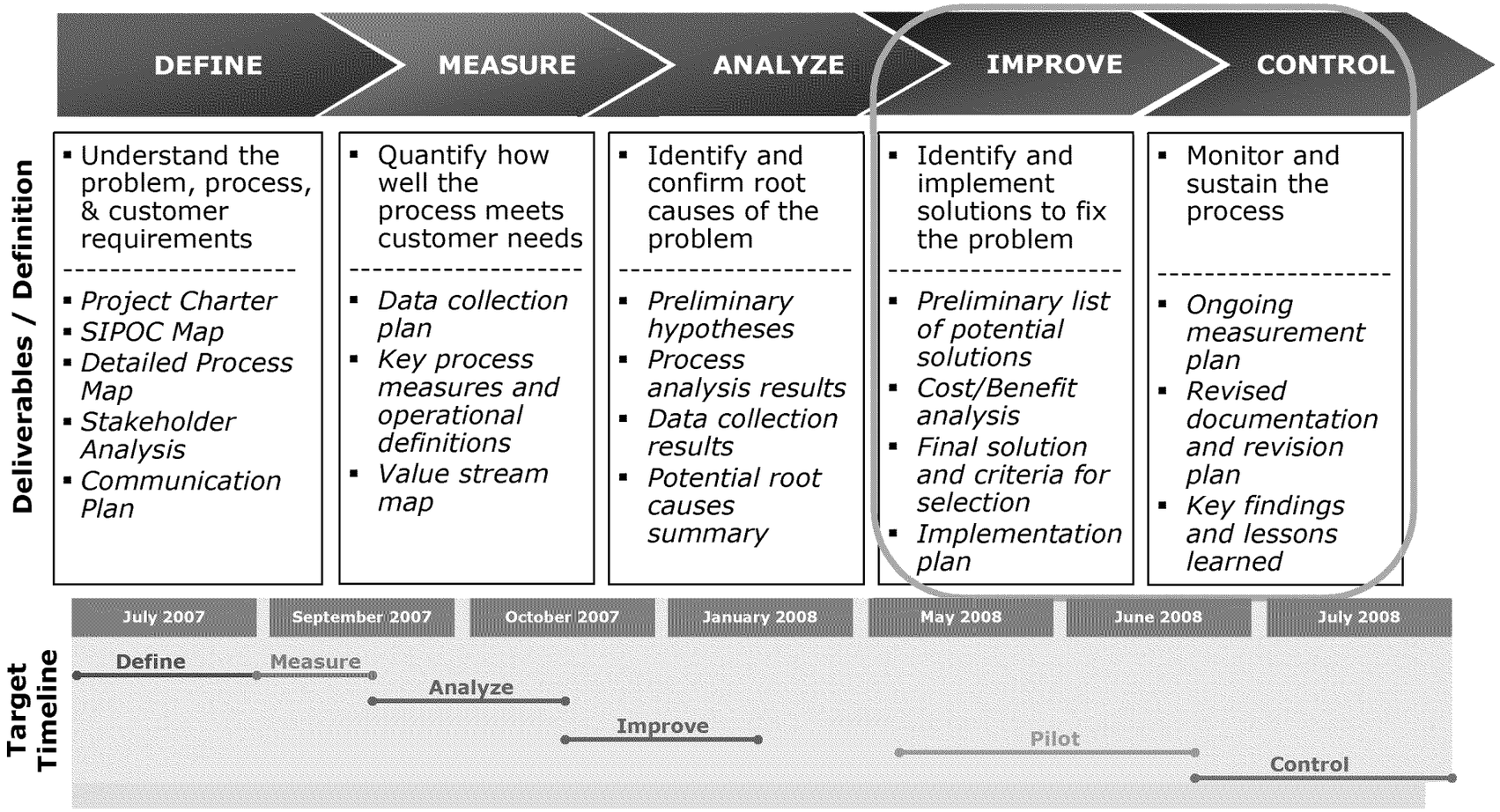

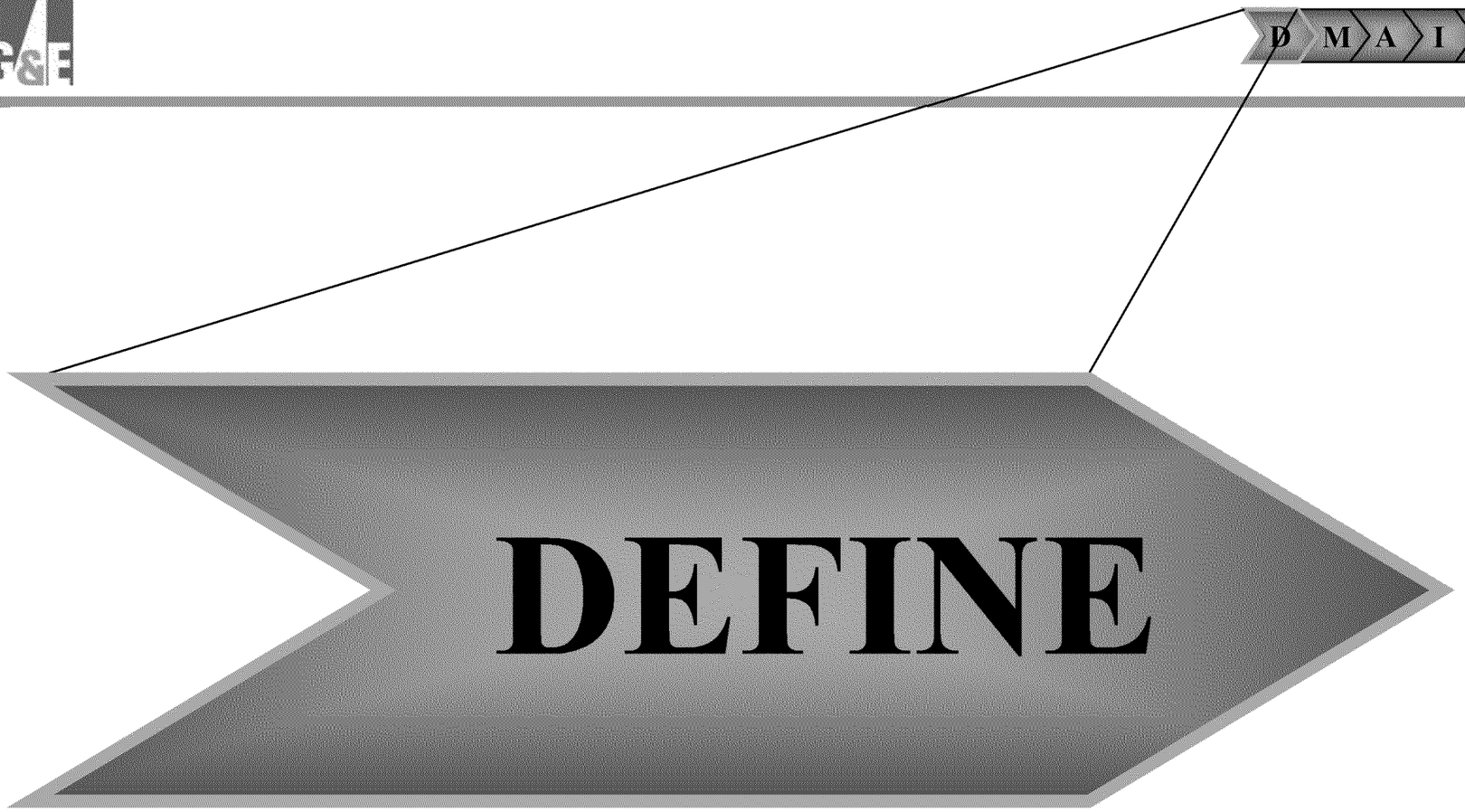

Project Charter

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Business Case & Functional Area KPI

Improvement in the restoration cycle for equipment requiring repair will improve electric distribution system (EDS) reliability. KPI: Reliable Energy Delivery Index – Reliability of Service -No Outages.

Customer

External: Electric Distribution Reliability
Internal: Energy Delivery

Problem Statement

In 2006, 5171 units of equipment requiring repair were identified. From 2003 to 2006, the backlog of equipment requiring repair increased 44% to 2282 units.

Goal

Reduce average cycle time for repair of Priority 1 devices to 30 days by December 2008 with 50% yield. Priority 1 devices: fuses, interrupters, line reclosers, circuit breakers, and sectionalizers, switches/ disconnects.

Key Stakeholders

Champion: Mark Johnson
Process Owner: Chris Turner
GB or BB: Redacted
Team: QA, T-men, PM, EAS, Planning, Ops, M&C, SS
Mentor: None
MBB: Redacted

Financial Impact

The mean cost of poor quality for 2008 protective devices is (at 50% yield):
- 1.9 SAIDI minutes
- 0.01 SAIFI interruptions

Primary Metric – Incidents

Defect: Cycle time > 30 days
Opportunity: Improve EDS reliability
Primary: ERR restoration cycle time
Secondary: SAIDI/ CAIDI
Consequential: EC Notification backlog

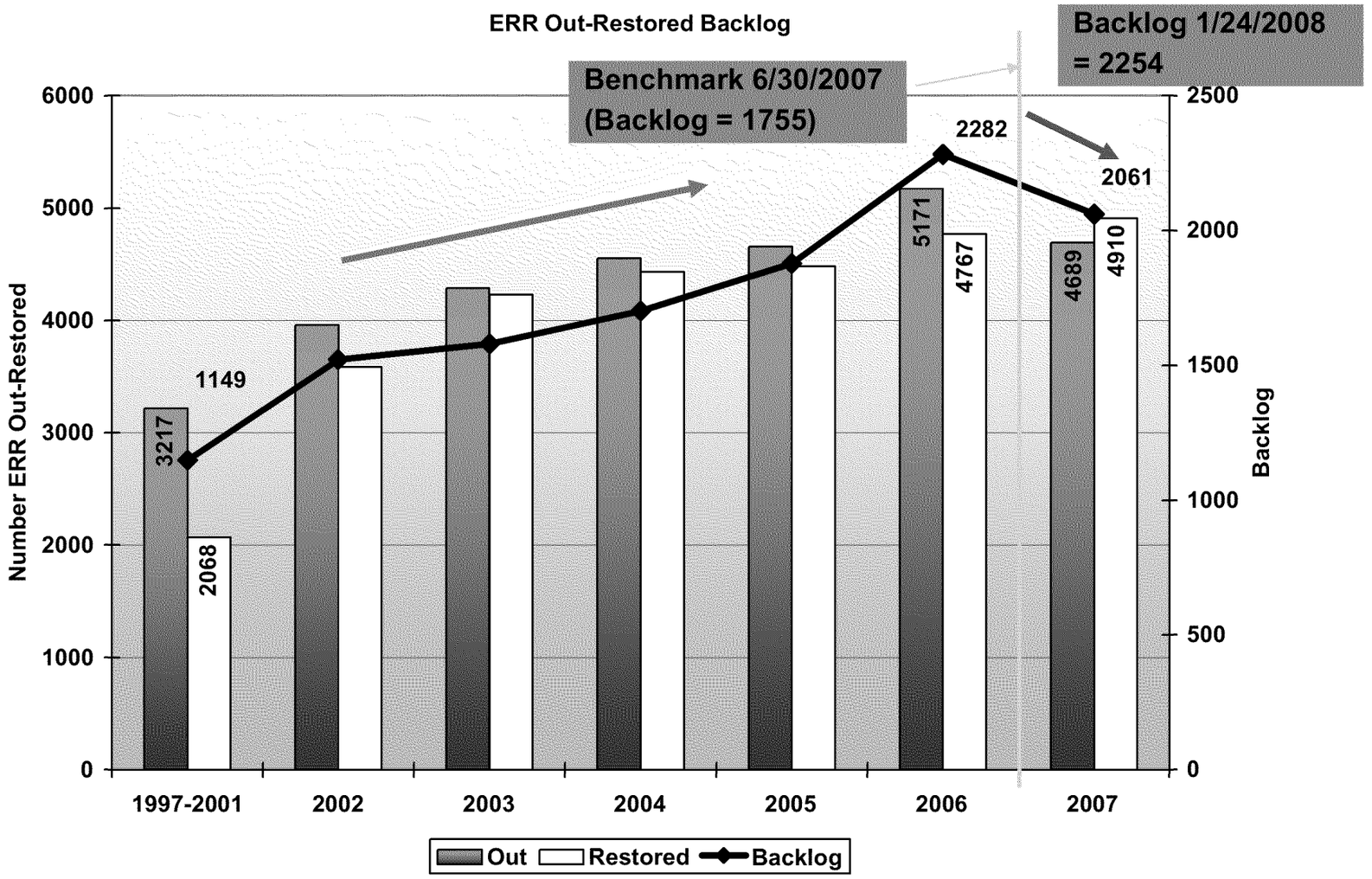
Scope

Process Start: Identification of equipment needing repair
Process Stop: Equipment is repaired and restored.
In Scope: Distribution and Substation ERR, focusing on key equipment types having a strong linkage to reliability or operation/compliance requirements.
Out of Scope: Transmission ERR

Project Duration

Step	Start Date	Planned Completion	Actual Completion
Define	7/10/07	7/31/07	7/31/07
Measure	7/31/07	9/18/07	9/18/07
Analyze	9/18/07	10/17/07	10/17/07
Improve	10/17/07	1/15/08	1/15/08
Control	1/15/08	tbd	

ERR Backlog History



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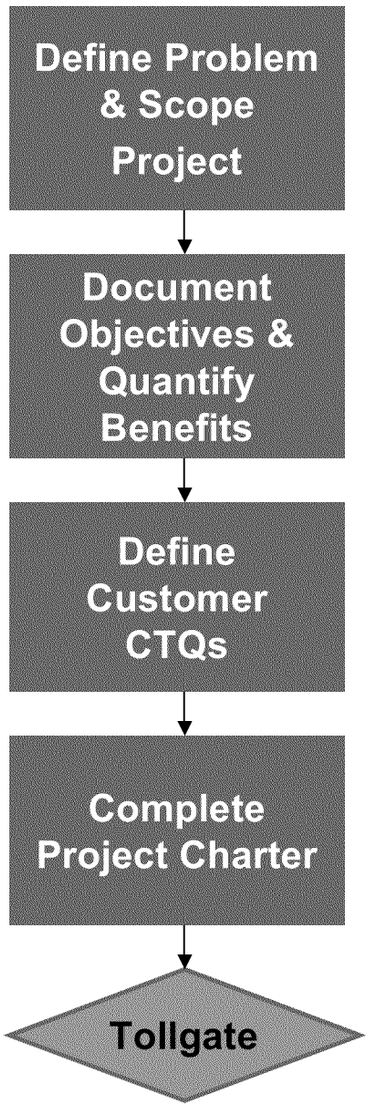
SB_GT&S_0777542

Active ERR 6/30/2007

Equipment	No.	CT (Days)
Switch	634	375
Cable	226	404
Line Recloser	166	185
Fuse	152	369
Regulator	132	197
Transformer	84	343
Circuit Breaker	78	262
Other	74	376
Capacitor Bank	70	113
Substation	31	336
Disconnect	29	210
Sectionalizer	19	268
Interrupter	18	342
COIS	15	285
Booster	11	327
Autobooster	6	126
Stepdown	4	116
Jumpers	3	93
Network	3	196
OVERALL AVG	1755	322

- Switches are the most common equipment type (36%)
- Cable has the longest cycle time
- Protective devices (line reclosers, fuses, circuit breakers, sectionalizers, and interrupters) represent 25% ERR backlog
- Rule 2 devices (regulators and capacitor banks) ~ 10% ERR backlog

Define Phase Summary

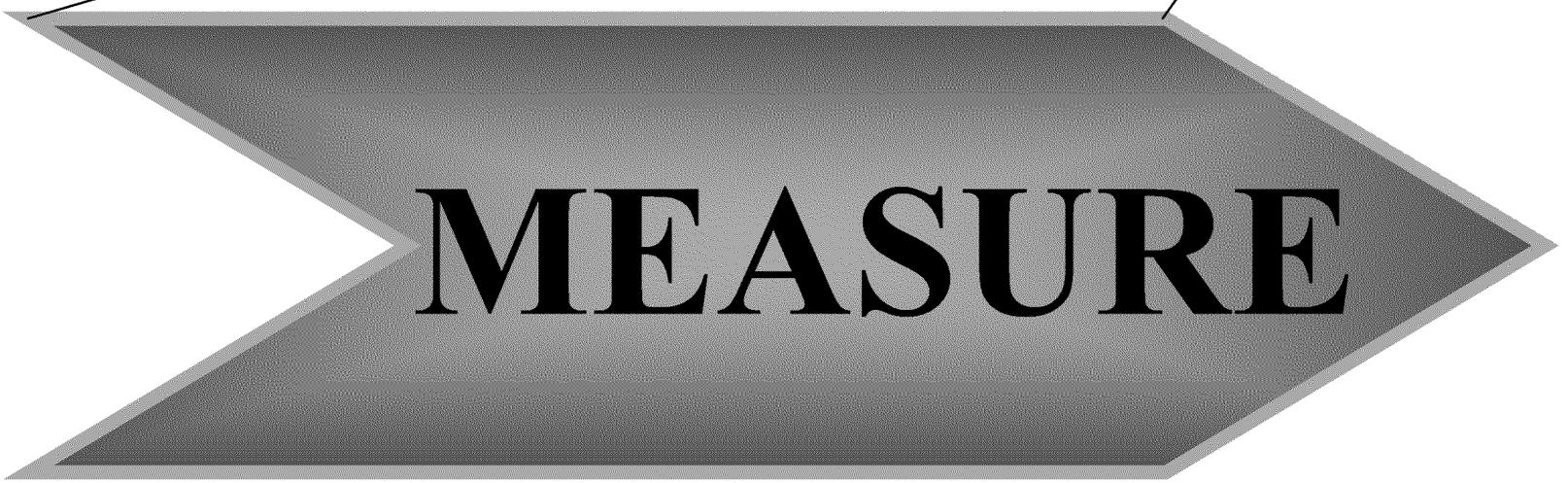


Summary of Findings

- From 2003 to 2006, the backlog of equipment requiring repair increased 44% to 2282 units.
- Average cycle time = 322 days for backlog on 6/30/2007, which had 1755 items
- Switches represent 36% backlog

Conclusions

- Each ERR-Out has increased, ERR-Restored has increased, and backlog has increased.
- Cycle time is the key metric



MEASURE Overview

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Data Collection

- ERR from 2001 to mid-June 2007
  - Focus on ERR from Jan-2005 thru Jun-2007 (30 months)
- System information list on 6/30/2007
- SCADA AND UG Cable
- EPCM notifications (SAP)

Benchmark Survey

- SDG&E, SCE
- Repair protective devices quickly (<5 days)
- Prioritize based upon safety and service reliability

Active ERR (6/30/2007)

- Backlog = 1755 devices
- 50% have EPCM Notifications
- 60% active ERR are either Priority 1 or no priority (blank/0)
- Priority 1 ERR cycle time > no priority cycle time
- 20% ERR in Diablo Division

ERR-Restored 2005/2006

- 4481 (2005), 4767 (2006)
- 40% are protective devices, switches and disconnects
- 40% are Rule 2 devices (cap banks and regulators)

Defect Definition

Defect = Cycle Time >30 days for devices having significant impact on system reliability

2006-2007 ERR Cycle Time

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Equipment Type	Average Cycle Time (Days)
Autobooster	122
Booster	130
Cable	215
Capacitor Bank	70
Circuit Breaker	80
COIS	149
Disconnect	132
Fuse	120
Interrupter	150
Jumpers	64
Line Recloser	80
Network	101
Other	114
Regulator	90
Sectionalizer	134
Stepdown	158
Substation	94
Switch	119
Tie Cable	53
Transformer	108
TOTAL	100

- Cycle time = date out to date restored (backlog is calculated from date out to Dec-31-2007)
- Includes all ERR-Out from Jan-1-2006 thru Dec-31-2007
- Highlighted devices ("Reliability ERR") have the most impact on reliability
- Average Cycle Time for highlighted devices = 107 days

Cycle Time for Reliability ERR = 107 days

Measurement System Analysis (MSA)

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Active ERR report (6/30/2007)

- ILIS screen does not display Priorities per Bulletin 2007-10
- 102 of 291 SCADA items are not checked on the ERR report

System Information List (6/30/2007)

- 9 SIL should have been noted on ERR (about 2%)

- Budget Process

Year	No. ERR-Restored	Budget
2006	4767	$5.4M expense, $6.2M capital
2008	1580 (budgeted)	$5.2M expense, $6.5M capital

ERR population appears to be complete

Accuracy of details can be improved

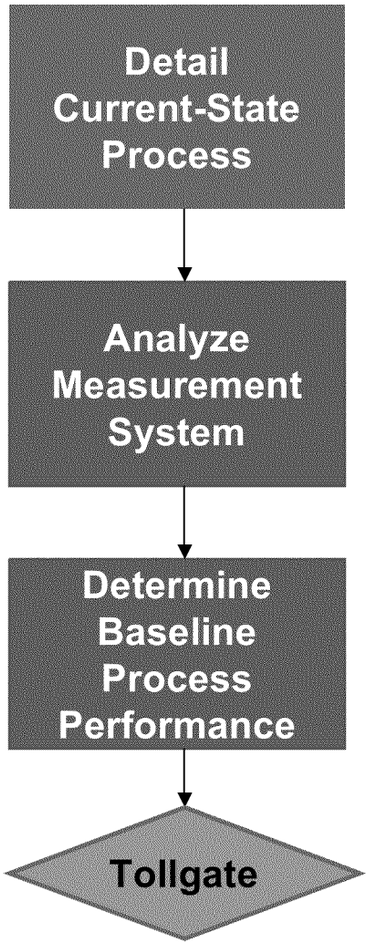
Budgets data needs to be validated

SCADA

Simon Wong has developed a process for SCADA.

- Objectives:
  - [1] company-wide maintenance support model
  - [2] repair 80% time on first trip (currently less than 60%)
  - [3] repair in 72 hours (for selected equipment)
- Schedule:
  - Set up 15 shops (mid-August 2007)
  - Complete job aides (mid-Sep 2007)
- There is no program to address SCADA backlog
- 35% SCADA are not flagged in ERR

Measure Phase Summary

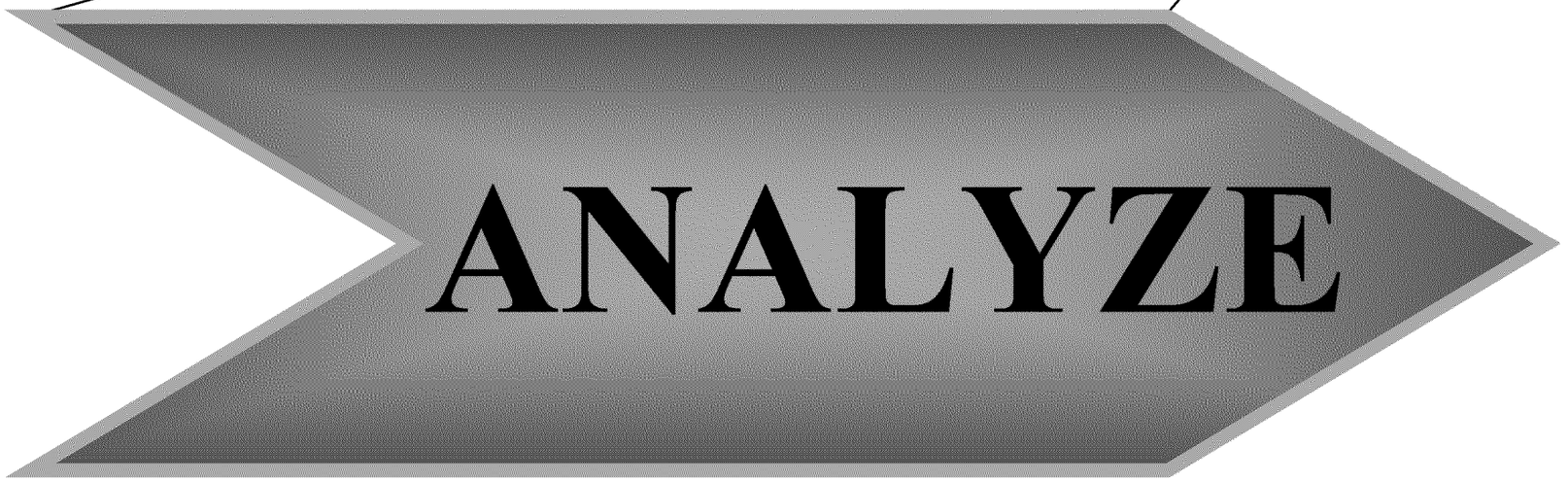


Summary of Findings

- ERR population appears to be complete
- Accuracy of ERR details can be improved
- Budget data needs to be validated
- There is no program to address the backlog
- Cycle time for key reliability ERR = 193 days
- Benchmark = 5 days for protective devices
- 50% ERR have no ECN
- ERR prioritization process is not effective

Conclusions

- Key reliability ERR are: switches, disconnects, line reclosers, fuses, circuit breakers, sectionalizers, interrupters
- Budget data needs to be validated
- PG&E cycle time far exceeds the benchmark



Critical X's

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- Critical To Quality
  - Accurate ERR and System Information Report
- Critical To Time
  - Cycle time (ERR-out to ERR-restored)

Cost of Poor Quality

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Reliability Impact Calculation

Do not restore 2007 ERR backlog

- Backlog (12/31/2007) = 2061 devices
- 5.7 SAIDI minutes/ year
- 0.04 SAIFI interruptions/ year

Do not restore new 2008 ERR

- 5000 new ERR
- 6.8 SAIDI minutes
- 0.05 SAIFI interruptions

LOW IMPACT

EQ Type	#	SAIDI	SAIFI
Protective Devices	950	3.7	0.03
Cable/ COIS	300	0.2	0
Switches/ Disc.	1250	1.2	0
Circuit Breakers	300	1.7	0.02

Reliability Impact/ EQ Type

EQ Type	SAIDI (min/yr)	SAIFI (int/yr)
Cable/COIS	7500	0
Disconnect	7500	0
Fuse	10,000	375
Interrupter	40,000	375
Circuit breaker	60,000	575
Line Recloser	40,000	375
Sectionalizer	40,000	375
Switch	10,000	0
Other	-	0

Potential Failure Modes and Effects Analysis (FMEA)

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Process Steps or Product Functions	Potential Failure Mode	Potential Effects of Failure	Severity (1-10)	Potential Cause(s) of Failure	Occurrence (1-10)	Current Controls	Detection (1-10)	Risk Priority Number (RPN)
ID ERR	Not recorded in ERR (2% in SIR, not ERR)	- Not monitored by ERR - Not prioritized	9	DO error	3	None	9	243
Create ERR	T-men not doing minor repairs (quick hits)	Unnecessary ERR	9	Shortcut or no materials	3	DO enters the ERR	3	81
EPCM	EPCM not created	- Increase ERR backlog - Not prioritized - Not repaired	9	Unclear requirements	9	ORT, T-men supv, WRC, PE, Distribution Supv	3	243
EPCM	No pin# assigned to EPCM	Delay, except for emergency work	3	Asking RMC to ID pin#	3	Compliance	3	27
Estimating	Capital work not being estimated due to lack of resources	- Increase backlog - Increase cycle time	9	- Resources - LH not prioritizing - Lack of ownership	9	ERR, EPCM/SAP, job owner	1	81
Estimating	Cable estimating only during 2H year	- Lower sytem flexibility - Delayed work - Temporary splicing	9	- Resources - LH not prioritizing	9	ERR, EPCM/SAP, job owner (PE is the job owner for 56 projects)	1	81
Estimating	Lack of ownership	- Loss of velocity - No estimate	9	- Poor communication - Accountability	9	ERR, EPCM/SAP	3	243
Scheduling	Budget reductions reduce ERR work	- Increase backlog - Increase cycle time	9	Most common cause is new business	9	Budget controls are in place, but ERR is not a	1	81
Scheduling	ORT not effectively prioritizing ERR	- Increase backlog - Increase cycle time - Lower priority work being	9	- Too large backlog - ERR is not a high priority	9	There is no control on ORT to ensure that this activity is performed	9	729
Complete work	Planned work not completed	- Increase backlog - Increase cycle time	9	- Funding - Not scheduled - Lack of materials	3	ERR, EPCM/SAP	1	27
Inactivate in ERR	Completed work not removed from ERR	- Backlog - Repeat visits	9	Not reporting properly to DO (with pin#)	3	- Compliance - ORT	3	81

In most cases, adequate controls exist, but can be used more effectively

Fishbone Analysis

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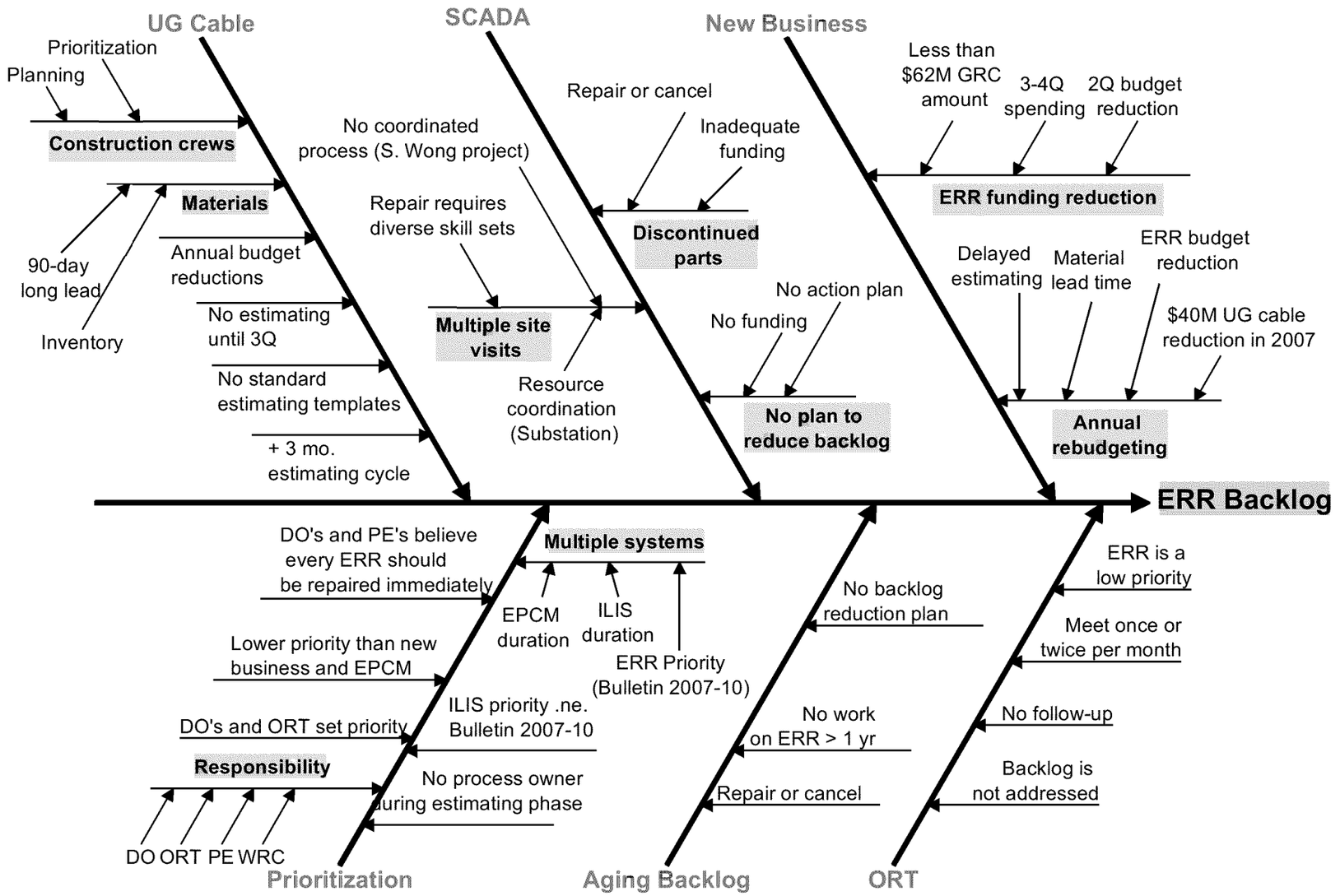

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Preconceptions .v. Analysis

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1	Capacitor banks drive the seasonal cycle-time spikes	UNKNOWN. Cannot be statistically confirmed based upon ERR databases
2	PG&E's ERR process, cycle time, and backlog are similar to other utilities	FALSE. Other CA utilities restore protective devices, switches and disconnects in < 5 days
3	Prioritization is effective	FALSE. Dual responsibility (OTR and DO). All ERR is high priority to DO's. No job owner. ILIS ≠ SAP. Priority 0 has lower CT than Priority 1.
4	Cycle time is mainly driven by estimating delays	FALSE. 50% ERR-out have no EC notification. 50% of active ERR are "expense". Backlog is major driver.
5	Historical ERR costs are accurate	FALSE. Need to look at costs from multiple programs
6	Reduced ERR cycle time will improve reliability	TRUE. Focus on devices with high impact on reliability.
7	ORT meetings are effective, or at least part of the solution	FALSE. Monthly or bi-weekly meetings are too infrequent to support the metric (Slide 18)
8	A significant number of active ERR have actually been restored	FALSE. Diablo study found 5 of 377 (less than 2%) (Slide 30)
9	Cycle time delays are due in large part by lack of a job owner.	TRUE. Work got "stuck" at the EC notification and estimating "tombstones" due to the lack of a single job owner.
10	Cycle time delays are due in large part by lack of a job owner.	TRUE. Work got "stuck" at the EC notification and estimating "tombstones" due to the lack of a single job owner.

Root Causes and Conclusions

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ROOT CAUSES

- Aging backlog drives overall cycle time and COPQ
- Prioritization:
  - ERR is not a high priority in most Divisions, especially once it has aged
  - ERR work is annually deferred due to higher priorities
  - No ERR "owner" throughout the process
- ORT cycle increases ERR cycle time
- SCADA often requires multiple visits (Simon Wong project)
- Estimating for UG cable < demand and results in work being delayed every year
- Budget funding: inconsistent funding throughout the year
- Estimating and construction resources often do not match funding
- About 50% active ERR are expense work, so estimating is not required.

CONCLUSIONS

- Address aging backlog separately from new ERR
- ERR is not effectively prioritized relative to other maintenance work:
  - ERR is typically delayed for higher priority work
  - New ERR has higher priority than aging ERR
  - ORT is not the most effective vehicle for setting priorities and resolving ERR backlog
- ILIS .v. SAP:
  - ERR priority (ILIS) does not match EPCM duration (SAP)
  - Dual entry for PIN and EPCM
- Estimating efficiency will improve by using templates (compatible units), including most (80%) UG cable

Analyze Phase Summary

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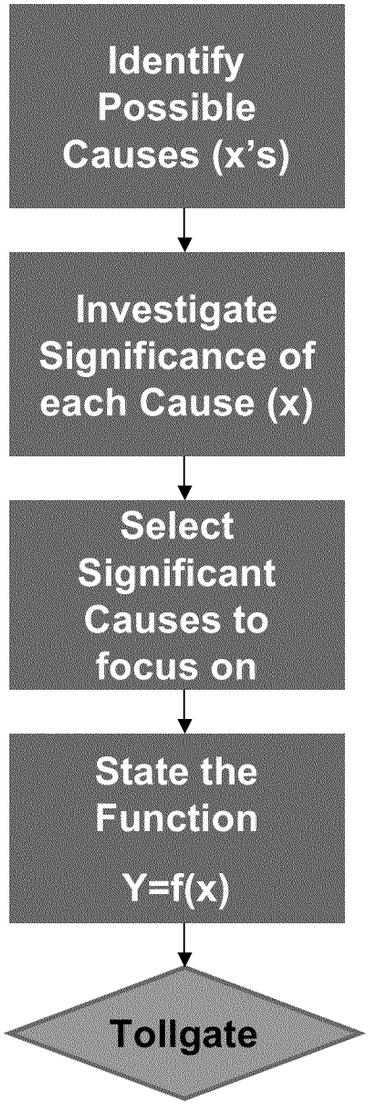
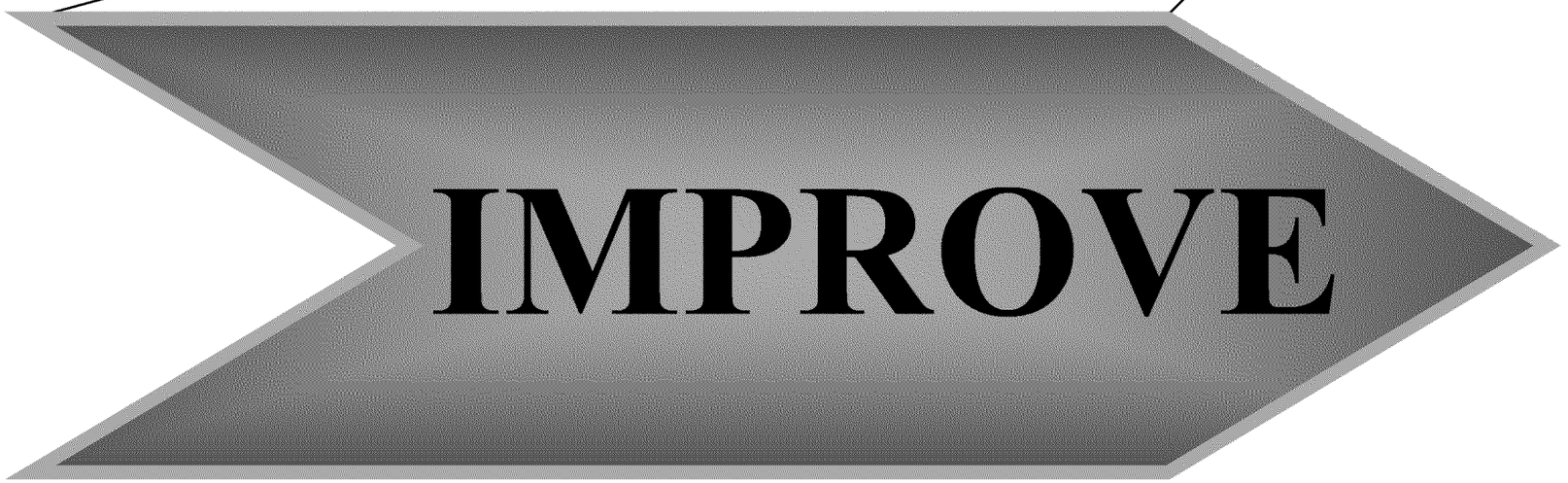


Summary of Findings

- Improving CT for "reliability" ERR will significantly improve SAIDI/SAIFI
- There are existing controls which are not being used effectively

Conclusions

- Focus on reliability ERR
- Establish in-process controls to "self-check" key steps in the process



Recommendations

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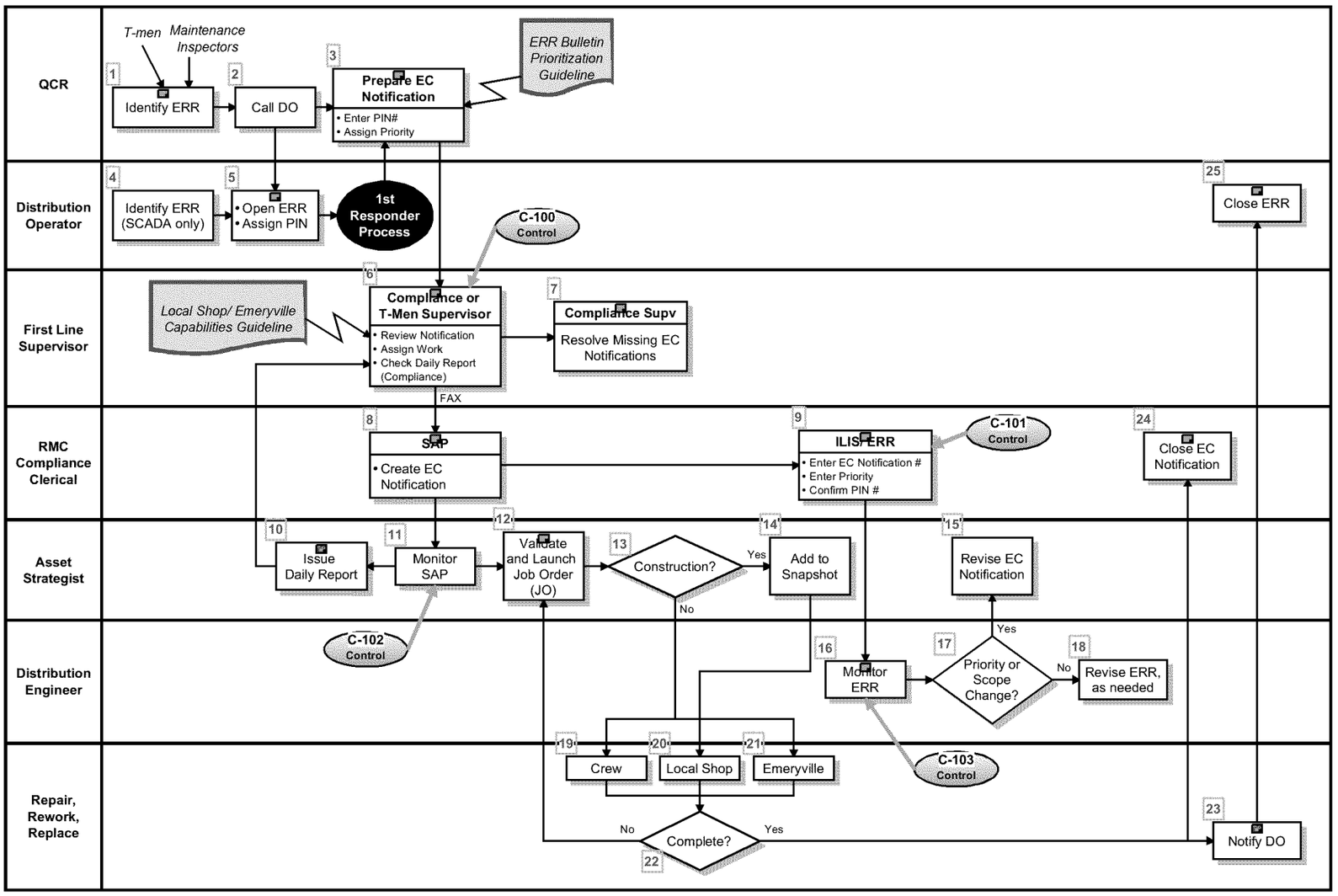
Priority	Probable Root Cause	Solution	Quick Hit	Impact	Time	Budget
1	Tags not written	PE monitor ILIS report Compliance ensure EC tag is prepared	✓	H	L	L
2	No end-to-end job owner	Asset Strategist	✓	H	L	L
3	T-men not performing minor work (e.g., renumbering, batteries)	•Establish a standard for T-men •Oversight by T-men supervisor	✓	M	L	L
4	Backlog	•Each Division "scrub" ERR to remove unnecessary or obsolete items •Provide justification for retained ERR		H	H	L
5	Lack of a common prioritization model	•Revise Bulletin 2007-10 to be consistent with metrics •Match in ILIS and SAP	✓	L	M 6 mos	L
6	RMC cycle time is not expeditious	Local clerks input Priority 1 EC notifications	✓	L	L	M
7	Inappropriate ERR items (leaking Tx or post-construction SCADA)	•Remove from ERR (backlog) •Provide direction	✓	M	L	L
8	Obsolete devices (mainly SCADA and switches)	Perform program to validate ERR and then repair, replace, retire, or remove.		M	H	M
9	Idle facilities on ERR	•Remove from ERR •Revise applicable standards		L	M	L
10	Missing ERR items	Provide clear direction to DO's (ERR .v. System Information Report)		L	M	L

To-Be Process Map



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Proposed Metric

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Metric (STIP)

Reduce average cycle time for repair of Priority 1 devices (listed below) to 30 days by December 2008:

- Protective devices: fuses, interrupters, line reclosers, circuit breakers, and sectionalizers
- Switches/ disconnects

Ratings

- 2 Rating: 60% of Priority 1 restored ≤ 30 d
- 1 Rating: 50% of Priority 1 are restored ≤ 30 d
- 0 Rating: 40% of Priority 1 restored ≤ 30 d

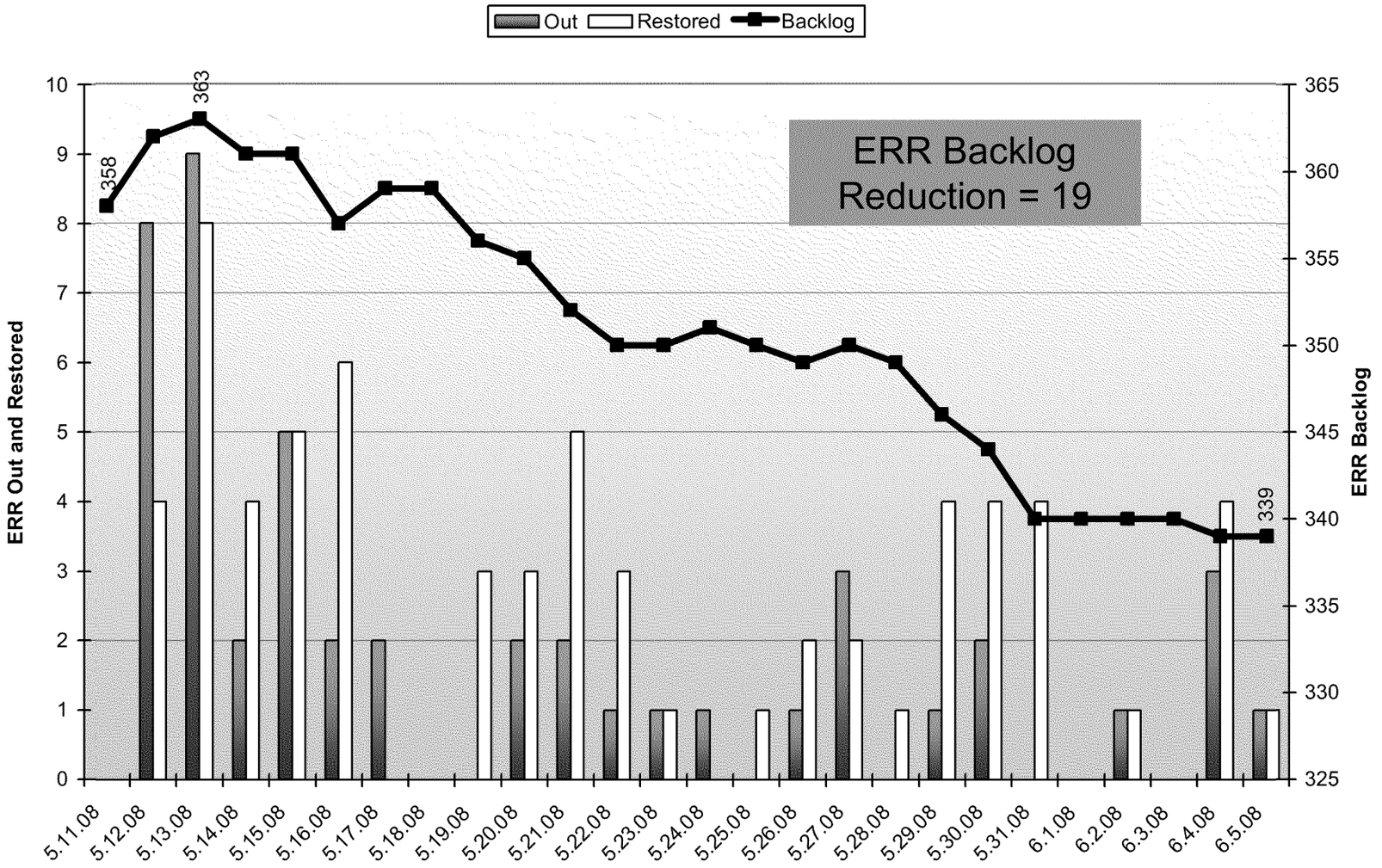
Notes

- **Applies to capital and expense devices**
- **Effective** date
- **Excludes backlog prior to** date
- **"Priority 1" refers to Priority P, Sub-Priority 1**
- **Cycle time (CT) is calculated from ERR-Out to ERR-Restored, as recorded in ILIS. CT is calculated as the average (mean) of the population**
- **Metric applies to Maintenance & Construction, Engineering & Operations, Customer Field Services (T-men), and RMC Scheduling.**

Diablo Pilot

May 12 – June 5

ERR Out-Restored-Backlog



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Diablo Pilot Results

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Equipment Type	ERR-Out	Restored	Reliability-ERR	Reliability-ERR Restored
Booster	1			
Cable	9	4		
Capacitor Bank	3	3		
Circuit Breaker	2		2	
Disconnect	1		1	
Fuse	2		2	
Line Recloser	2	2	2	2
Other	2			
Sectionalizer	2	1	2	1
Substation	1	1	1	1
Switch	27	17	27	17
Transformer	1			
TOTAL	53	28	37	21

Assigned PIN	53	28	37	21
Assigned Priority	27	21	22	14
Assigned ECN	13	13	7	3

COPQ Device Input

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COST OF POOR QUALITY (Annual)	SAIDI minutes/yr	SAIFI customers/yr
Disconnect	10,000	0
Fuse	40,000	375
Interrupter	40,000	375
Line Recloser	40,000	375
Sectionalizer	40,000	375
Switch	10,000	0

This input table was developed by Engineering, based upon a study of outage data from 2001-2006

Diablo Pilot - Cost of Poor Quality

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INPUT DATA			
Diablo Customer Count		304,999	customers
Annual # Days		365	days
2006-2007 #Reliability ERR/ yr	512/2=256	256	Devices
2006-2007 Diablo CT for Rel-ERR		169	calendar days
Pilot CT		14	calendar days
CT Variance		155	calendar days
Pilot Duration		5/12/2008	Start
		6/5/2008	End
		24	days
SAIDI/SAIFI IMPROVEMENT CALCULATION			
Diablo Pilot Reliability ERR		37	count
Diablo Pilot Reliability ERR Restored		21	count
Yield (actual for Pilot)	21/37=.568	57	%
Relibility Restored ERR CT (avg)		14	calendar days
CT Variance	169-14=155	155	calendar days
Pilot SAIDI Variance	21 ERR Total	220,832	minutes
Pilot SAIFI Variance	21 ERR Total	954	customers
Annual # Reliability ERR	One year	256	ERR
Yield (per Metric)	50%	128	ERR
Equivalent Annual SAIDI Variance	50%*256 ERR	4	minutes
Equivalent Annual SAIFI Variance	50%*256 ERR	0.02	customers

Improvement @ 50% yield
SAIDI = 4 minutes
SAIFI = 0.02 customers

Process Take-Aways (sheet 1)

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Distribution Engineer	Positive	• DE's actively reviewed ERR daily • Changing the attn. to and setting the priority worked well • Good job identifying a controller problem and changed the attention field.
	Negative	• DE's do not have a handle of what is or is not online in the field. e.g. booster offline and jumpers cut in the clear. Equipment could have been used to assist in an outage. e.g. Capacitor bank removed from pole 13 yea ago and the DE's assumed it was online the whole time.(equipment was used in power factor and other calculations) • ERR not discussed during ORT meetings. • Scrubbing of the ERR backlog was not consistent with what was directed in pages 25-39 in pilot manual. It wa discovered later in the pilot, the DE's began "scrubbing" using their own process before the pilot began • Not inputting N/A in the EPCM field of the Edit window in ILIS when the pin was short cycle work. • DE's not reviewing System Information. 6 items found on the System Info list that should have been on the ERR.
T-men	Positive	• T-men notifying DO to request close of pin when repairs are made • 5 of 17 pins were completed without generating an EC Notification (short cycle).
	Negative	• T-men are requesting items that should not be on the ERR such as "broken insulator" • Notifications not being filled out when the work is not short cycle.
Distribution Operator	Positive	• DO using EQUIPID correctly. i.e. NG splice on a section of cable. DO inputting "Splice" in field when abnormality is related to a splice • Equipment type, and Attention selection is good.
	Negative	• DO allowing abnormality on the ERR that should not be. i.e. broken insulator • Did not identify short cycle work. N/A not used in the EPCM field • Assigning priority 50% of the time • DO creating pin in System Info when the item should have been on the ERR list (i.e. renumbering and NG cable) • When closing a pin , the DO is using the last name of who completed the work. It was recommended in the ILI guide the DO use the LANID of the person who completed the work. Also, "closed out" is not being used in the Desc./Progress notes.
First Responder	Positive	• No info
	Negative	• No info

Process Take-Aways (sheet 2)

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T-men Supervisor	Positive	• No info
	Negative	• Not educating T-men in regards to what should go on the ERR. i.e. broken insulator that had no relation to equipment, was requested by the T-man to add to the ERR • EC Notification were not being generated when needed (40%).
Compliance Supervisor	Positive	• EC Notifications are being sent to the RMC's to be created • Copies of EC Notifications related to a pin were filed by the compliance analyst in office before they were sent to the RMC.
	Negative	• 32% (105 of 339) of active pins still do not have EC/EG Notifications.
RMC Compliance Clerical	Positive	• RMC is updating ILIS with the EC Notification number consistently.
	Negative	• 8 tags were generated during the pilot. It took an average of 12.5 days from the first responder to the RMC. One tag took as long as 21 days and as short as 6 days to be generated. Data used as follows: Days to generate: 21,13,12,15,8,13,6,13. (Snapshot)
Asset Strategist	Positive	• Strategist actively tracking pins being added and removed from the ERR. Worksheet generated by the Strategist provided valuable information for the duration of the pilot and beyond.(Consequential)
	Negative	• Time being taken out to perform other duties.
Work and Resource	Positive	• None
	Negative	• Scheduling takes a minimum of five weeks. Time it takes to set up a clearance is too long.
Estimating	Positive	• During pilot, was not able to analyze process.
	Negative	• Funding issues to package Capital job to get worked.
Crew, TSM&C Shop, Emeryville	Positive	• TSM&C shop doing a great job querying for pins (equipment) designated and making the necessary repairs. 1 of 17 were completed by shop and no EC Notification was generated (short cycle).
	Negative	• Limited resources and funding to efficiently and effectively address ERR backlog.

Action Plan

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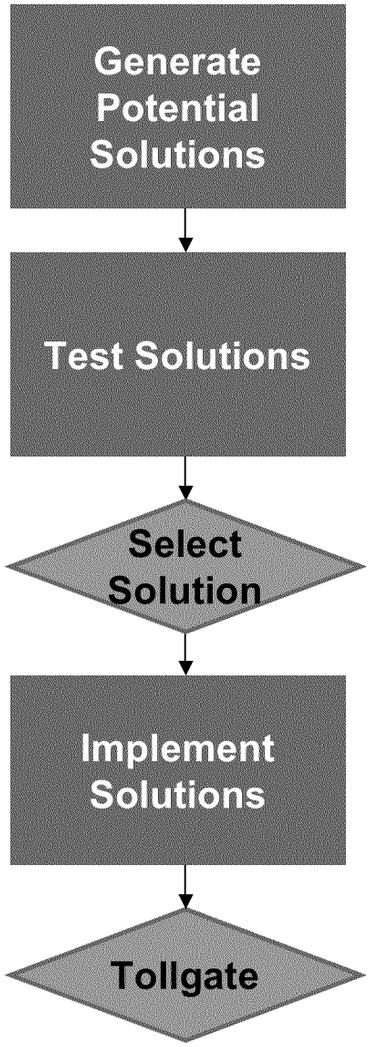
Priority	Action	Resolution To	Barriers
1	Priority codes and durations	• Focus on P1 or P1 and P2 • Duration = 30 days?	Effective coordination and implementation
2	Integrate ERR and SAP: • EC#, PIN#, Priority, Description, EQ Type • Attention, ERR-Out Date, ERR-Restored Date	• Duplicate entry • No priority • Missing ECN#; T-men not creating ECN • Consistent description	• T-men and MI paperwork timeliness • RMC entitlement
3	Instructions • DO guideline, ERR bulletin • Backlog instructions, Financials	• Clearly defined roles and responsibilities • Supervisor engagement	• Address lessons learned in Diablo Pilot
4	Training for all new procedures	Effectiveness: 30% face-to-face training; 40% supervisor buy-in/ follow-up; 20% checking; 10% audit	• Training attendance • Supervisor buy-in and follow-up
5	Resource-load local TSM&C shops	• Short-cycle work	Resources/ headcount
6	Distribution engineer: • Daily review of work scope and priority • "Scrub" backlog	• Strategic prioritization model • Assess repair .v. replace	• DE priority (time) • ORT validation (not critical path)
7	T-men actions: • Do minor work (minimize # ERR) • Create ECN with PIN# and description • Report correct "out" and "restored" date	• Reduce # ERR • Accurate reporting • Complete ECN	• Training • Effective verification
8	Short-cycle work: • Fast track P1's (SCADA, batteries, 1st responder) • LH create ECN (not RMC)	• Quick response team for SCADA and simple repairs	TSM&C resources
9	Estimating templates	• 80% cable via a simple template • Other equipment	ESC implementation

Improve Phase Summary



Summary of Findings

- See recommendations
- See Diablo Pilot “take-aways”
- See “To-Be” Process Map
- See “To-Be” Process Guidelines

Conclusions

- Initial preconceptions at project start ≠ LSS analyses
- Implement improvements resulting from Diablo Pilot
  - Process Maps
  - Instructions
  - DO Guidelines

Effectiveness of Controls During Pilot

D M A I C

- **C-100**- Supervisor did not fill out an EC Notification when one was required. Asset Strategist sent report of missing Notifications associated with an ERR pin daily. “Issued to” work around in SAP was not utilized.
- **C-101-** Copy of Notification associated with a pin in the ERR was filed with the Compliance Analyst until the Notification was created in SAP.
- **C-102-** RMC is updating ILIS with Notification # consistently.
- **C-103-** Strategist reviewed ERR daily and sent a comprehensive report of active pins with/without EC Notifications. List also included days out, date pin was created, SCADA related, etc.
- **C-104-** Control not exercised by Strategist. Trish informed Cindy not to use.
- **C-105-** The control for the DE”s to ensure N/A was inputted into the SAP# field in ILIS, was **not** exercised. The system info list was not reviewed resulting in items that should have been on the ERR were not captured; therefore not prioritized and weather or not the item was short cycle work. It turns out 3 of the 6 items that should have been on the ERR, were short cycle. However, the DE’s reviewed and validated the ERR daily and did a good job overall. E.g. DE’s identified a controller replacement and followed the new procedure well (except for N/A inputted in SAP# field). DE’s changed the attention field to SCADA specialist/ Concord Distribution Engineering and changed the priority to a 1. The tag was created in 13 days and pin is still active on the ERR. The attention field was changed to the correct dept. when needed.
- **C-106-** Feedback from the DE’s is positive regarding the new Daily ORT Review opposed to the bi-weekly ORT meetings. The daily review creates a sense of urgency to identify the root cause of the outage and promptly develop solutions to prevent the problem from reoccurring. The backlog of the ERR was not discussed during the bi-weekly ORT meeting (that’s a given!). The DE’s were disappointed the subject of the ERR pilot was not mentioned (Metaphor: like the giant elephant in the room). I think Ted is right about the overall results of the Pilot: until the shoe drops (directives from above), the sense of urgency of the pertinent parties to learn and actively participate in the new processes, will not be taken seriously.

Control Outline

D M A I C

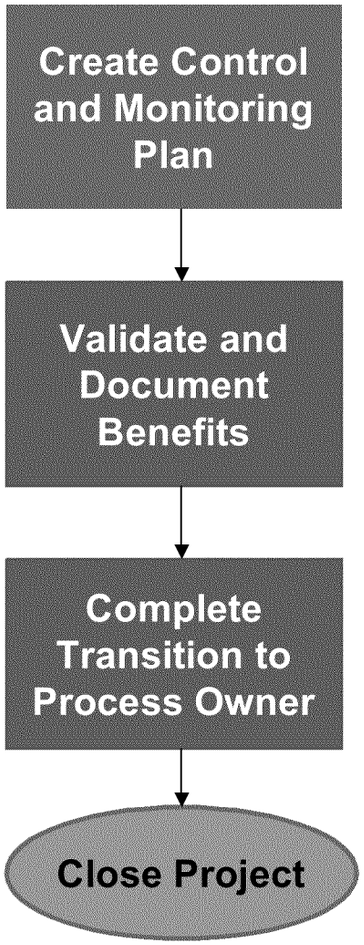
- Report cycle time metrics and backlog in ERR software
- Trend monthly metrics
- Maintain 100% controls defined in Process Map
- Process oversight by Asset Strategist
- Sampling by Process Owner

Control Plan

D M A I C

Process Step	**ERR Cycle Time Report**
What's Controlled?	**Cycle time for P1 priority equipment**
Input or Output?	**ERR input**
Spec. Limits/ Requirements	**CT=30 days with 50% yield for P1 equipment**
Measurement Method	**Validate accuracy of the following data:** **▪ EQ Type ▪ Priority ▪ Description ▪ PIN# ▪ ECN#** **▪ ERR=SAP ▪ ERR-Out date ▪ ERR-Restored date** **▪ DE validation of priority & scope ▪ Estimating duration** **▪ Effectiveness of short-cycle work ▪ P1's expedited?** **▪ Effective use of Attention field ▪ Right work by right group**
Control Method	**Random sampling and in-process controls**
Sample Size	**50**
Frequency	**Quarterly**
Who/ What Measures	**Process owner**
Where Recorded	**Process owner files**
Decision Rule/ Corrective Action	**>5% change in CT; Address probable root cause**
SOP#	**na**

Control Phase Summary



Summary of Findings

- Diablo Pilot establishes a baseline for improving the in-process controls
- The existing ERR report provides sufficient data to determine the proposed metric

Conclusions

- Process Owner should sample quarterly to assess process effectiveness and sustainability of process improvements.

Attachments

D M A I C

- Process Maps
- Instructions
- DO Guideline

Transition Plan

D M A I C

- Complete Prioritization Model
  - Aug Complete model
  - Oct Provide training/guidance
- Bulletins/ Instructions/ Guidelines
  - Sep Complete draft
  - Oct Training
  - Nov Effective system-wide
- Scrub Backlog – System-wide
  - Oct Complete scrubbing
  - Nov Complete action plan for backlog
- Metric
  - Dec 2008 metric (December only)
  - 2009 Establish 2009 metric

GRC2011-Ph-I_DR_DRA_206-Q02gAtch01

Diablo Division Pilot

To-Be ERR Process Map

-- 7 -- Distribution Engineer / ORT

-- 8 -- 1st Responder

-- 1 -- Distribution Operator

-- 2 -- QCR

-- 3 -- T-Men Supervisor

-- 4 -- Compliance Supervisor

-- 5 -- RMC Compliance Clerical

-- 6 -- Asset Strategist / Program Manager

-- 10 -- Work & Resource

-- 11 -- Estimating

-- 9 -- Crew, TSM&C Shop, Emeryville

IDENTIFY ERR AND ENTER PIN

1 Provide Settings — E-MAIL

ILIS Guidelines for ERR

Distribution ERR Bulletin (tbd)

2 Coordinate with ORT — C-107 Control

3 Monitor ERR (Daily) — C-106 Control

4 Scope Change? — No / Other Changes / Yes

5 E-MAIL — Revise ERR OR Notify DO

FIRST RESPONDER

- SCADA Problem
- Battery Replacement
- Renumbering
- Fuses

6 TSM&C Shop
- Resolve
- Contact other applicable personnel as needed:
  - Electrician
  - T-men
  - SCADA Spec.
  - IT Telecom

7 Repaired? — Yes / No

PHONE

ILIS Guidelines for ERR

Bulletin 2007-10

8 Identify ERR (SCADA only)

9
- Open ERR
- Assign PIN
- Input Initial Priority Code

10 Short-Cycle Work? — Yes / No

11 Controller? — Yes / No

DAILY

E-MAIL

CLOSE ERR

12 Close ERR — Done

T-men *Maintenance Inspectors*

13 Identify ERR

14 Call DO

INPUT EC NOTIFICATION

15 Prepare EC Notification
- Enter PIN#
- Assign Priority

16 T-men? — Yes / No

Distribution ERR Bulletin (tbd)

TSM&C Shop/ Emeryville/ Marysville Capabilities Guideline

C-100 Control

17
- Review EC Notification
- Complete all Mandatory Fields
- Indicate Work Group to Perform Work ("Issue to")

CORRECTIVE MAINTENANCE PROCESS

Distribution ERR Bulletin (tbd)

18
- Review EC Notification
- Complete all Mandatory Fields
- Indicate Work Group to Perform Work ("Issue to")
- Check Daily Report

19 Resolve Missing EC Notifications

20 Monitor/ Quality Control — C-101 Control

C-102 Control

FAX

E-MAIL

23 SAP — Create EC Notification

24 Confirm EC Notification Created

25 ILIS/ ERR
- Enter EC Notification #
- Check Priority

26 Priority Conflict? — No / Yes

E-MAIL

Blue Folder

21 Send Job Package to TSM&C Shop or Emeryville/ Marysville

22 Quality Review (Compliance) — C-103 Control

FAX

27 Complete or Cancel EC Notification

28 ERR Closed? — Yes / No

E-MAIL

29 Issue Daily Report — DAILY

30 Monitor SAP — MONTHLY — C-104 Control

31 Receive Blue Folder

32 Program Manager — C-105 Control

ILIS

SAP

33 Resolve Priority Conflict

34 Revise EC Notification

Blue Folder (Company Mail)

35 Validate and Launch Job Order (JO)

36 Estimating Req'd? — Yes

37 Add to Estimating Snapshot

38 Construction? (Crew) — No / Yes

39 Add to Construction Snapshot

40 Request Compliance to Send Job Package

DO

E-MAIL

41 Resolve Closure Conflict with DO

42 WRC — Schedule Work

Blue Folder

43 Estimating — Develop Estimate

44 Crew

45 TSM&C Shop

46 Emeryville/ Marysville Field Repair

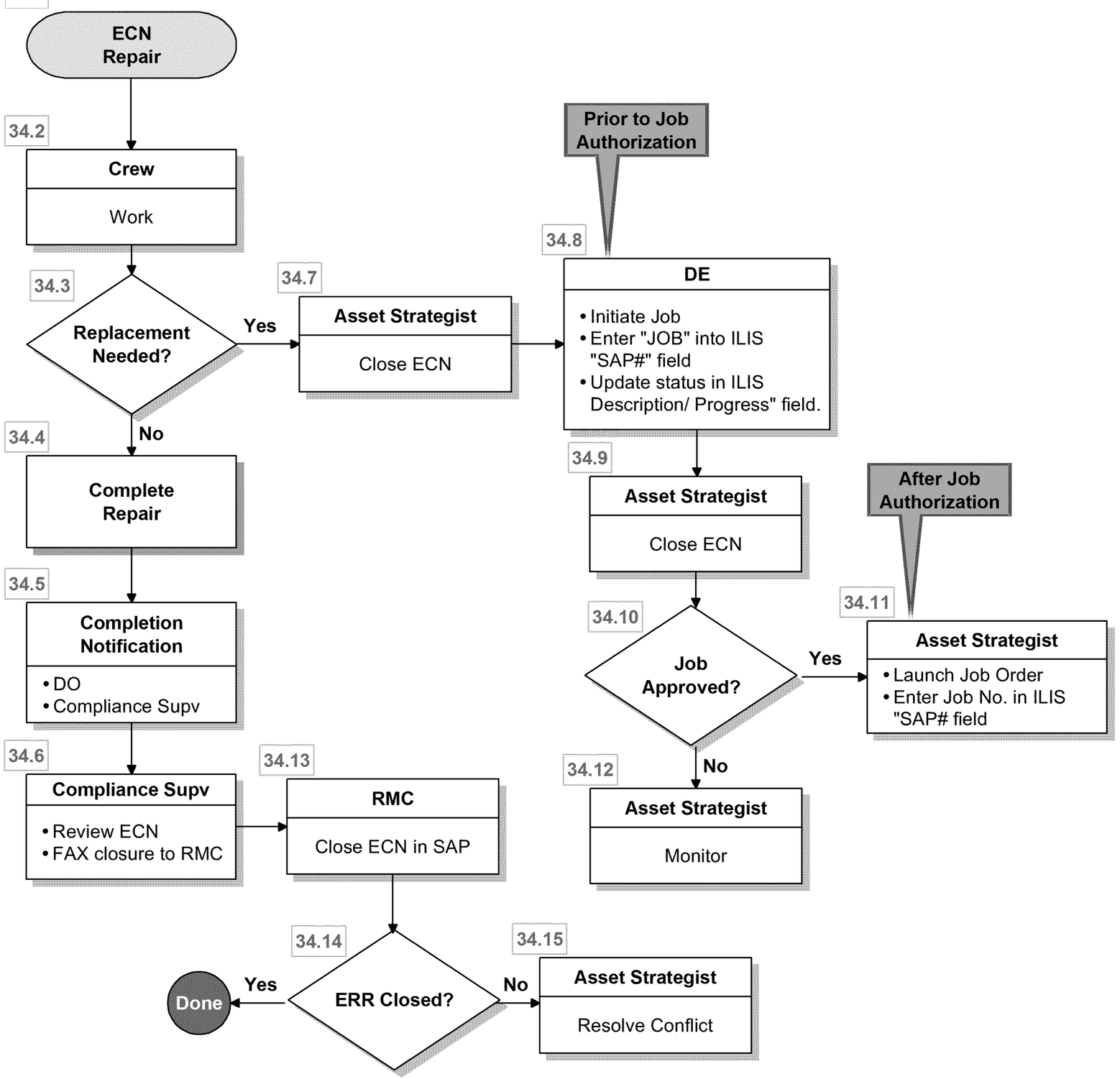
E-MAIL

CLOSED EC NOTIFICATION or JOB PACKAGE

47 Complete? — No / Yes

48
- Contact DO to Close PIN
- Notify Compliance

To-Be ERR Process Map



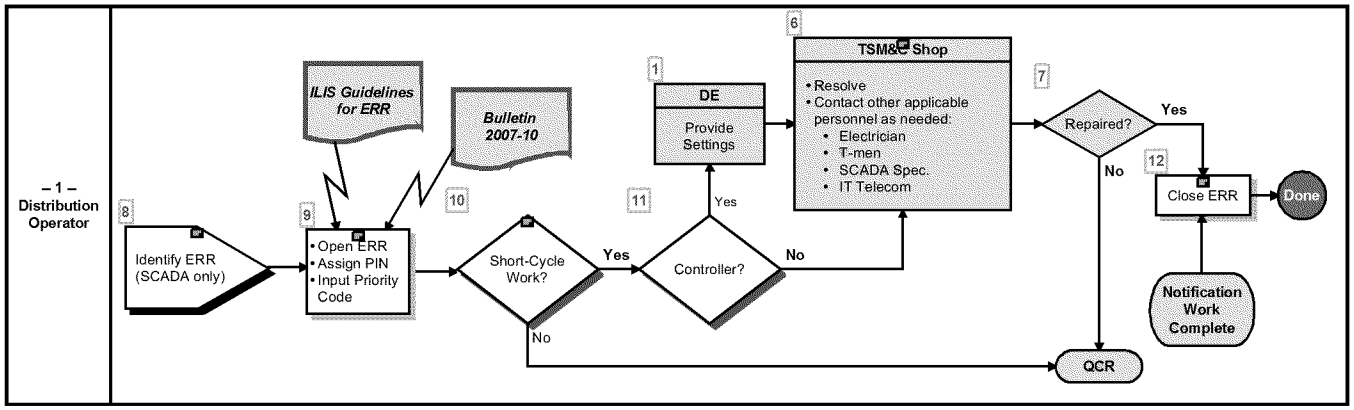
EQUIPMENT REQUIRING REPAIR – PROCEDURE

Table of Contents

References

1) ILIS Guidelines for Diablo Division Pilot
2) TSM&C Shop/ Emeryville /Marysville Capabilities Guideline
3) Distribution ERR Bulletin
4) Bulletin 2007-10

1- Distribution Operator



Task Descriptions

Box	Input	Task	Output
8	Note: If SCADA, no EC Notification is needed initially.		
9	Identify inoperable SCADA device	1) Create ERR per Bulletin 2007-10 and ECCO Standard S2200, including PIN#. 2) Select Equipment Type from the dropdown menu. 3) EQUIP ID: • If the inoperable equipment number is known, enter it into the "Equip ID" field. • In other cases, the "Equip ID" field may be used when additional equipment identification is needed. For example, "Elbow" or "Splice" may be entered as the Equip ID for Equipment Type "Cable". 4) For substation equipment: • Attention: "Substa-Antioch" or "Substa-Concord" • Substation radial button is checked • Appropriate equipment type is identified 5) If the ERR can be resolved via the Short-Cycle process, ensure: • "EPCM Tag" field indicates "N/A" • "Attention" field indicates "SCADA Specialist" (see Note 1 below) 6) Assign Priority (see Note 2 below): • "P1" for all protective devices (fuses, interrupters, reclosers, sectionalizers, circuit breakers, switches, and disconnects), and SCADA for substation and auto transfer schemes. • "P2" for all other ERR 7) Determine whether or not the restoration can be	"Active" ERR entry Direct short-cycle work

Box	Input	Task	Output
		"short-cycle" work (see Note 3 below)	
10	Short-cycle work (see definition above)		
11	Short-cycle work	Determine if the problem is potentially associated with the controller: • If "yes", update the ERR description/ progress field and add "Engineering Concord or Antioch" to the Attention field. • If "no", update the ERR description/ progress field accordingly.	ERR update
12	Communication from 1st responder, crew, TSM&C shop or Emeryville.	Follow already established ECCO processes/ procedures (e.g., Standard S2200)	Closed ("inactive") ERR
13	Active ERR determined by DO to NOT be short-cycle work	1) DO dispatch T-man 2) Update ERR comment field to reflect status	ERR update

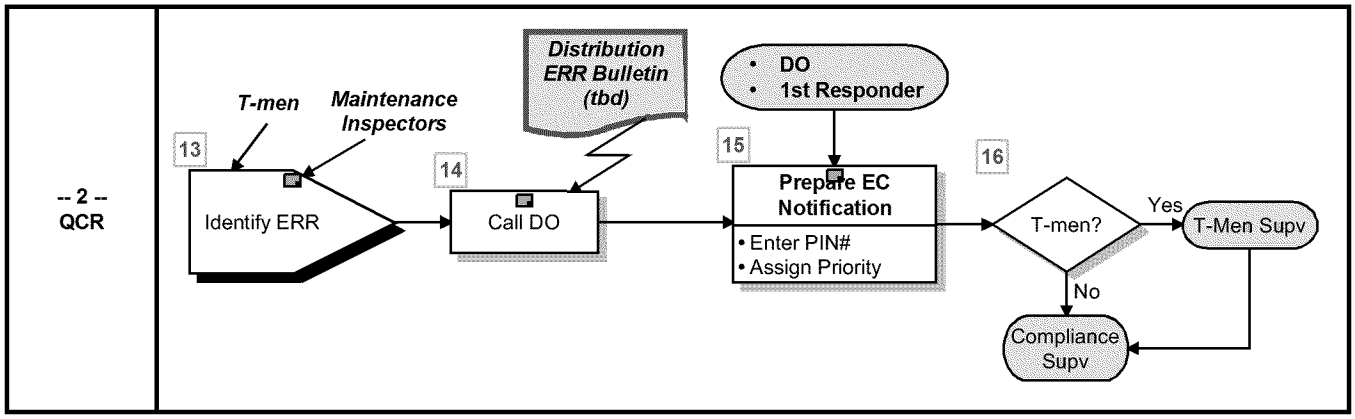
Notes:

1) Using "SCADA Specialist" is only interim until ILIS is re-programmed to include the following selections:
   - TSM&C Electric Equipment Shop

2) The DE will monitor ERR entrys daily and refine the priority assignment, as needed to comply with the ILIS Guideline.

3) Short-cycle work includes:
   - SCADA problems
   - Controller replacement
   - Battery replacement
   - Renumbering
   - Fuses

2 - Maintenance Inspectors & T-Men



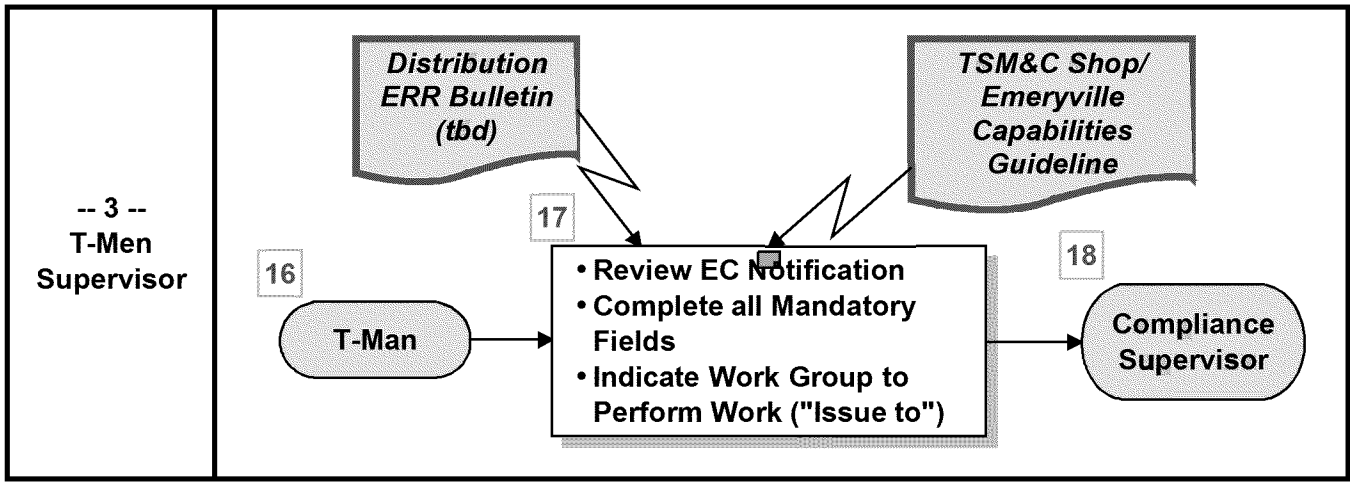
Task Descriptions

Box	Input	Task	Output
13	Inoperable equipment	1) Contact the DO and provide pertinent information. 2) Perform minor work (e.g., replace battery, renumber) if it can be done safely.	Contact DO while onsite.
14	Collect pertinent information	Call DO to initiate ERR and help troubleshoot. Supply all pertinent...	Information to the DO
15	Field conditions and PIN#	1) Write an EC Notification. Include pertinent information such as: • PIN# • Priority Code: Per priority guideline (P1 or P2 for most ERR and G for voltage regulating equipment related to Rule 2) • Required End Date: 30 days for P1 • Object= Check appropriate facility • Damage (Condition): "INOP" (inoperative equipment). • Location: Include geographic location (ideally GPS) and equipment ID. • Comments: Accurately describe the inoperable equipment and conditions. • Attach platt map, as appropriate 2) Submit EC Notifications to your supervisor. See Note 1.	• Submit EC Notification to your first-line supervisor. • Expedite ERR-related EC Notifications (daily).
16	EC Notification	• T-men submit to T-Men Supervisor. • Others submit to Compliance Supervisor	Supervisor quality control

Notes:

1) ERR-related EC Notifications s hould be communicated/submitted daily.

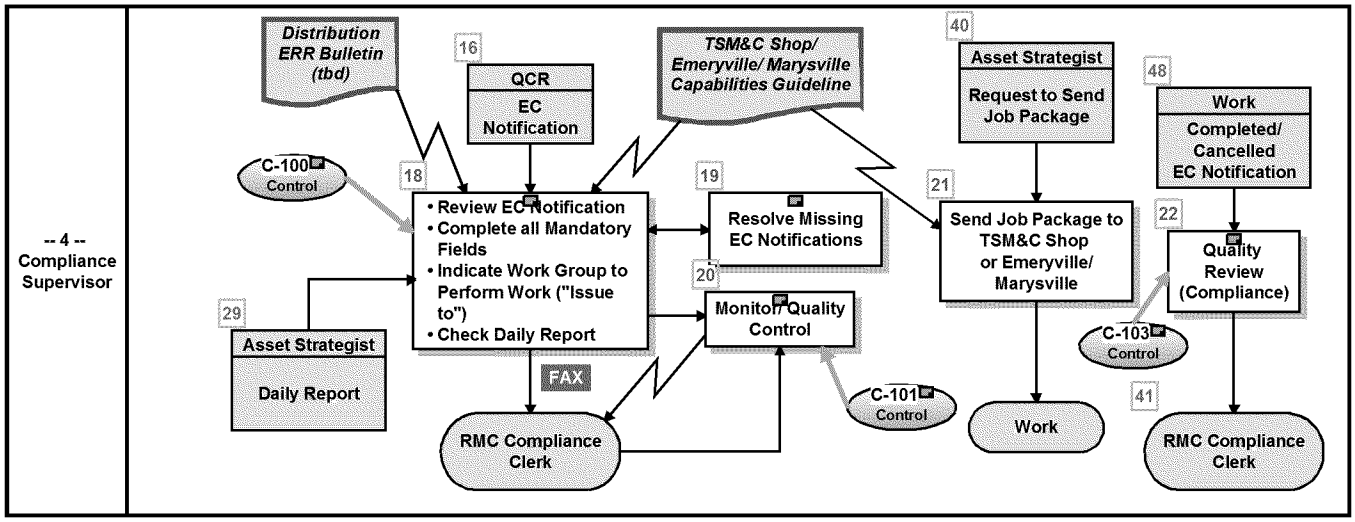
3 - T- Men Supervisor



Task Descriptions

Box	Input	Task	Output
16	See 2-QCR		
17	EC Notification from T-man	1) Review EC Notification specifically for: • PIN# • Priority Code: Per priority guideline (P1 or P2 for most ERR and G for voltage regulating equipment related to Rule 2) • Required End Date: 30 days for P1 • Object= Check appropriate facility • Damage (Condition)= "INOP" (inoperative equipment) • Appropriate comments • Platt map is attached, as appropriate • Source Side Device • Ensure all required fields are completed and correct (e.g., functional location, work type, work center, county code, division code) 2) Assign work to crews, local shops, or Emeryville, as appropriate and per the Capabilities Guideline. Use "Issued To" field (will be entered in the "Applicant Name Field" in the SAP EC Notification).	Send to Compliance Supervisor for processing
18	See 4-Compliance Supervisor procedures		

4 - Compliance Supervisor



Task Descriptions

Box	Input	Task	Output
18	• EC Notification from QCR • Daily Report from Asset Strategist	1) Resolve every ERR with a blank EC Notification field • If needed, create an EC Notification • For closed ERR ensure that the corresponding EC Notification is closed or cancelled 2) Perform Quality Review of EC Notification for consistency and expectations: • PIN# • Priority Code: Per priority guideline (P1 or P2 for most ERR and G for voltage regulating equipment related to Rule 2) • Required End Date: 30 days for P1 • Object= Check appropriate facility • Damage (Condition)= "INOP" (inoperative equipment) • Appropriate comments • Plat map is attached, as appropriate • Ensure all mandatory fields are completed and correct (e.g., functional location, work type, work center, county code, division code) 3) Assign work per the Capabilities Guideline. Use "Issued To" field until SAP is upgraded. [After SAP is upgraded, use the name field in the	FAX EC Notification to RMC Compliance for input and cross-reference of EC Notification to PIN#. RMC Compliance Clerk FAX number is 8-760-9852 or (916)760-9852.

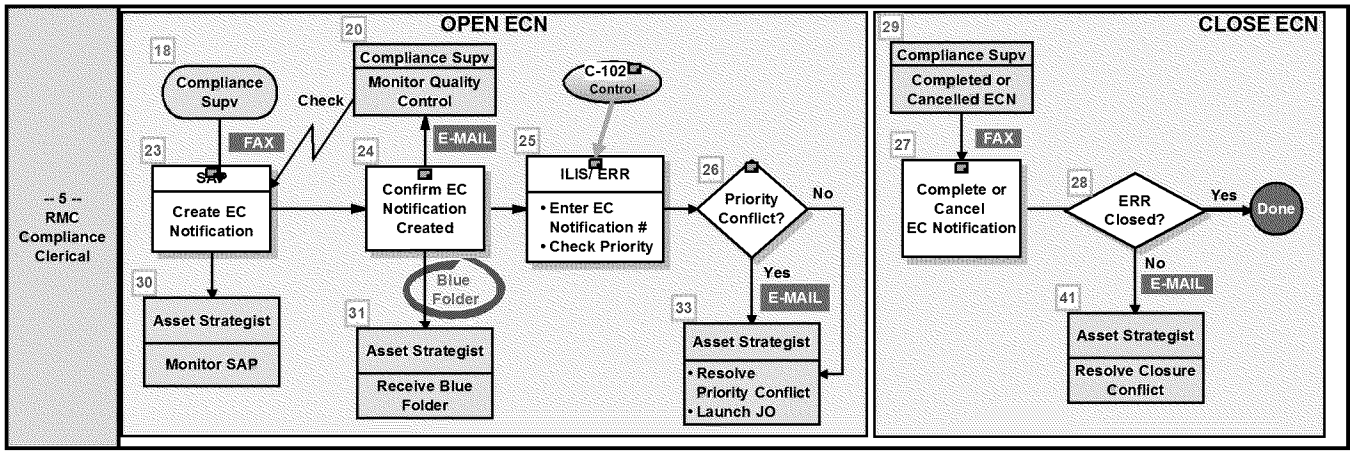
Box	Input	Task	Output
		address for notification.] The options are: • TSM&C Equipment Shop • Emeryville Shop • Marysville Shop • OM&C-Antioch • OM&C-Concord 4) Assign budget information (see Note 1).	
19	Daily Report (from Asset Strategist)	1) Check to see if ECN Notification is in process (e.g., RMC Compliance Clerical) 2) Send/request QCR (Maintenance Inspector/T-men) to field check 3) Interface with T-Men Supv to write missing EC Notifications, where applicable	• Write EC Notification if needed. • For new EC Notifications, FAX to RMC Compliance Clerical for entry.
20	EC Notification	1) File copy by PIN# 2) Retain until the EC Notification is created in SAP 3) Check SAP input and resolve any corrections with RMC Compliance 4) After checking, the copy may be discarded	Corrected EC Notification
21	E-mail Request for Action from Asset Strategist	• Send job package to either TSM&C Shop or Emeryville/Marysville, as appropriate. • Record status in SAP	Transmittal to appropriate work location
22	Completed or cancelled EC Notification	Verify EC Notification	FAX to RMC Compliance Clerical
C-100	**CONTROL – Compliance Supervisor** 1) Review Daily Report (from Asset Strategist) and resolve missing EC notifications 2) Review EC notifications for quality vs. EDPM Manual and Distribution ERR Bulletin 3) See Box 18.		
C-101	**CONTROL – Compliance Supervisor** Check SAP input by RMC (see Boxes 20 and 22)		
C-103	**CONTROL – Compliance Supervisor** Check completeness of closure documentation		

Notes:

1) See References
2) MWC Budget Information

ERR Type	Emergency Repair	Emergency Replace	Non-Emergency Repair	Non-Emergency Replace
OH ERR			BGJ	57J
UG ERR			BGK	57K
UG Cable (ERR)			BGK	56C
UG Cable (non-ERR)	BHC	17C	BGD	57B
OH (non-ERR)	BHB	17B	BGC	57A

5 - RMC Compliance Clerk



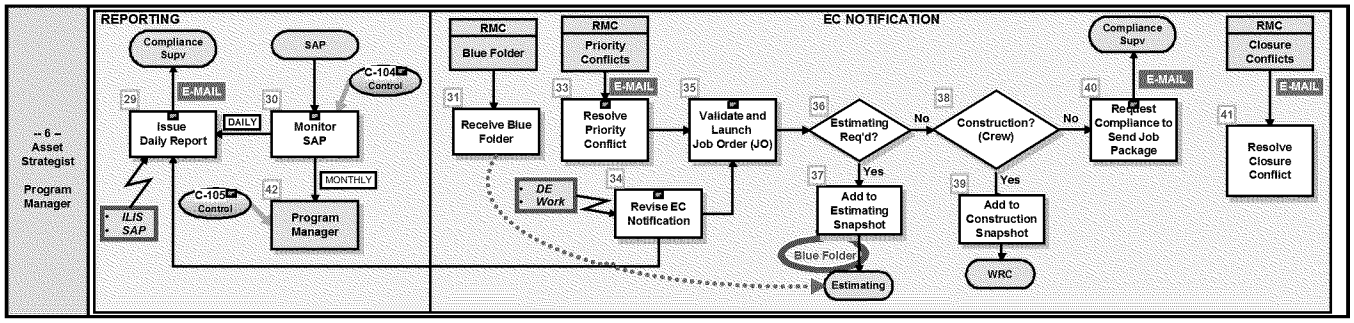
Task Descriptions

Box	Input	Task	Output
23	Faxed EC Notification from Compliance Supervisor	1) EC Notification entry to SAP • Enter PIN# (e.g., PIN#82) into the Text Field of the Repair Tab • Enter "Issue to" work group to perform the work in the "Name field of address for Notification" (Interim process until " Issue to" field is added in SAP) The options are: i) TSM&C Equipment Shop ii) Emeryville Shop iii) Marysville Shop iv) OM&C-Antioch v) OM&C-Concord • Enter "Circuit" into the "Circuit #" field 2) For EC Notifications with a work type that requires estimating, prepare the initial blue job package and mail the package to the appropriate Asset Strategist. 3) The initial job package includes: • Design Package Transmittal (clerk completes the information in the general information section except for the order number) • EC Notification • Copy of map 4) Requirements • Timely and accurate entry of EC Notification • Quality control checks • Time commitment = 24 hours	• Pending SAP EC Notification • Blue job package (as needed)
24	SAP-created EC	1) Prepare e-mail to Compliance (cc: Asset	Email to Compliance

Box	Input	Task	Output
	Notification by RMC Compliance Clerk	Strategist). 2) Indicate in the subject line "ERR Division PIN#" (for example, "ERR DI PIN #82" or "ERR DI PIN Various"). 3) In the body of the email, specify PIN#, EC Notification # and Date Created (e.g., PIN #82, EC Number #103018309, 5/15/08)	(cc: Asset Strategist)
25	Pending EC Notification in SAP	• If the EC Notification has a PIN#, find the ERR in ILIS and enter/reflect the associated EC Notification number • Input EC Notification priority into ILIS	Updated ERR in sync with SAP relative to EC Notification # and priority
26	ILIS: Until ILIS is updated to reflect the Priority Code (e.g., G, P1, P2, P3, P4), look at the Description/ Progress Notes for the Priority Code. To access the Description/ ProgressNotes, open the applicable PIN# and select "Edit". SAP: Priority Code for EC Notification corresponding to the PIN#	1) Compare Priority Codes in SAP and ILIS 2) If there is a conflict, notify the Asset Strategist via email. Indicate in the subject line "ERR Division PIN# - Priority Code Conflict" (for example, "ERR DI PIN #82 - Priority Code Conflict" or "ERR DI PIN Various - Priority Code Conflict"). In the body of the email specify: • PIN#, Priority Code (e.g., "PIN #82, Priority P1") • EC Notification #, Priority Code (e.g., "EC Notification 103018309, Priority Code G")	Email priority conflicts to Asset Strategist
27	FAX from Compliance Supervisor of completed or cancelled EC Notification	Timely and accurately entry of completed or cancelled EC Notifications.	Enter completed or cancelled ECN into SAP
28	Completed or cancelled EC Notification	If the EC Notification has a PIN#, check ILIS/ERR to make sure the corresponding PIN is closed (ERR "inactive"). If it is not, send an email to the applicable Asset Strategist.	Email to Asset Strategist if corresponding ERR is not closed ("inactive").
30	Asset Strategist tasks		
31			
33			
41			

Notes:

6 - Asset Strategist



Task Descriptions

Box	Input	Task	Output
29	• Current SAP query (see Box 29) • Current ILIS query	1) Produce Daily Reports: • ERR missing EC notifications • ERR or EC notifications missing PIN# • ERR .vs. SAP priority 2) ID missing EC notifications, query parameters are: • ERR "out" date > May-12 • Non-substation (radial) • EPCM (SAP#) column ISBLANK • ERR "restored" date ISBLANK (not restored)	• E-mail to Compliance Supervisor • Request EC Notification resolution (daily)
30	Run NMT	1) Query by pending EC Notifications for ERR (e.g., PIN#, INOP and due date) 2) Sort by Division and show: • Division • PIN# • EC Notification # • Priority Code • Equipment • Circuit • Location • Due Date 3) Provide list of pending EC Notifications through year-end for ERR. 4) As applicable, request Compliance to perform a reassessment 5) As applicable, change the priority code	• Run Daily Report • Provide requested reports to Program Manager • See Note 1
31	Monthly Report from Asset Strategist	PROGRAM MANAGER Apply projected unit cost to determine the remaining units for funding Identify applicable external/ internal commitments (e.g., regulatory, community, asset strategy, standards/ mandates)	As needed re-direction of the program
33	Email from RMC	1) Resolve the conflict.	• Update EC

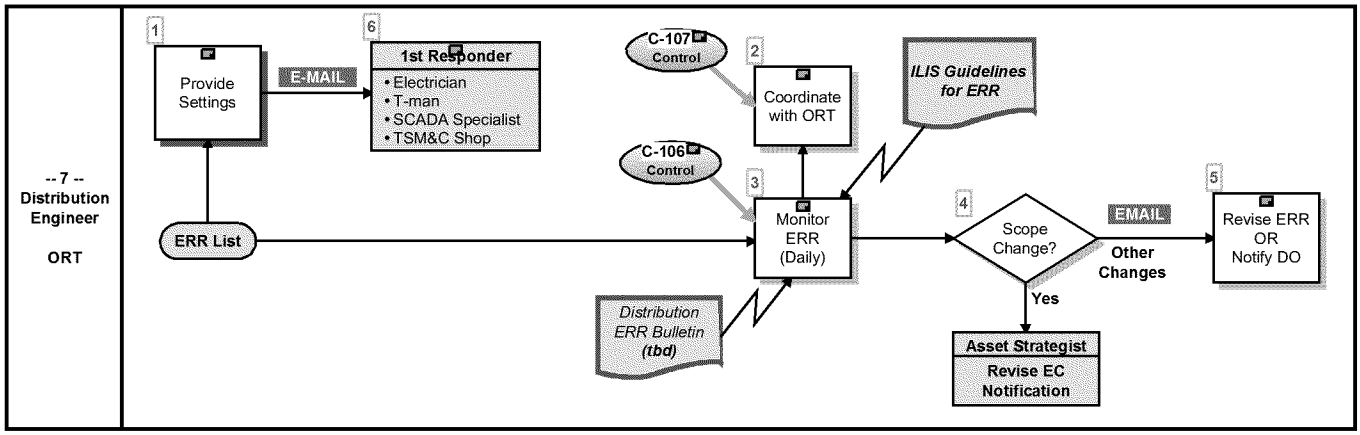
Box	Input	Task	Output
	Compliance Clerk noting a Priority Code conflict between ILIS and SAP.	2) If a change in Priority Code for work assigned to TSM&C Equipment Shop or Emeryville/Marysville, update the EC Notification. 3) If a change in Priority Code for work assigned to M&C, update the EC Notification and Order, and applicable Snapshot. Also send an email to the W&R Scheduler if the work is already scheduled).	Notification Priority Code (if needed) • Email W&R Scheduler, if needed.
34	• E-mail from DE with scope changes • E-mail from Work Groups with scope changes	1) Check email daily for changes initiated by the field 2) Make appropriate changes in SAP, including closing/opening notifications 3) Ensure ILIS and SAP are in sync	• SAP revisions • Notify Compliance Supevisor of changes through daily report
35	• Pending EC Notification (in SAP) • Priority conflicts between ERR and SAP (from RMC Clerical) • Scope changes (from DE review)	1) Validate and Launch Order • Be on the look out for short duration (break-in work). Handle accordingly. • Perform IN03 Dependency. • Validate order (e.g., due date, work type). • Add appropriate class. • Add schedulable operations, if needed. Add order to the applicable Snapshot. Contact W&R for short-duration (break-in) work • For work requiring estimating, ensure work packages are provided. 2) Resolve priority conflicts 3) Make any changes identified by the Distribution Engineer.	• Job Order • EC Notification corrections from Tasks 2 and 3
36	Asset Strategist has validated/ launched the Job Order and concluded the following: • Estimating is NOT required • Work is NOT construction (crew) work	1) Send email to the Compliance Supervisor and Compliance Analyst that the Order is created. 2) In the subject line, specifiy the ERR Division PIN# and work destination (for example, "ERR DI PIN #82 - Send Work to TSM&C shop or Emeryville/ Marysville"). 3) In the body of the email, specify the EC Notification # and Order Number	Email to Compliance Supevisor (cc: Compliance Analyst)
41	E-mail notification from RMC that there is a completed/ cancelled EC Notification has been submitted for	Work with DO to resolve conflict.	• Phone DO • ERR work status matches SAP

Box	Input	Task	Output
	closure, but the corresponding ERR (based upon PIN#) has not been closed.		
C-104	**CONTROL – Asset Strategist** 1. Daily review of SAP and ILIS 2. Identify ERR missing PIN# and/or EC notification 3. Confirm ERR and SAP priorities match 4. Issue a daily report to the Compliance Supervisor and request EC notification resolution 5. See Note 1		
C-105	**CONTROL – Program Manager** 1. Monitor budgets 2. Reprioritize based upon resource changes 3. Identify applicable external/internal requirements		

Notes:

1) On a monthly basis one of the Asset Strategists will run this for the system and provide it to the ERR Program Manager.

7 - Distribution Engineer/ ORT



Task Descriptions

Box	Input	Task	Output
1	ERR entry with "Attention: SCADA Specialist"	1) DE determines if settings are needed 2) If so, calculate the settings. 3) 3. Add an appropriate note in the ERR Progress Notes.	• Email settings to the TSM&C shop (Mauro Gaspparo,MFG5) • ERR Description/ Progress Notes entry
2	1) DAILY ORT REVIEW i) Attendees (led by Area Director): ii) Superintendent iii) Troubleman Supervisor iv) Supervising Senior Engineer v) Operating Supervisor vi) TSM&C Superintendent (if substation/transmission outage occurs) • For the previous day the team reviews all CB outages, all LR outages & fuse outages. • For each outage: i) Review the CAIDI/ DJR. Could have the response time be quicker? ii) Could we have restored more customers initially? iii) Review Outage Cause. Could we have prevented the outage. Do we need further patrols? iv) Completeness of outage report. • Meeting Purpose i) Meeting typically occurs in the early afternoon allowing each person to be prepared for the meeting. ii) Meeting typically shall not be used to discuss any other issues and should be brief. 2) MONTHLY (or bi-weekly) ORT REVIEW 3) For ERR, DE confirm work scopes and priority. Implement any changes by working with the DO's and Compliance.		
3	Daily review of active ERR	1) Review for Accuracy: • Recorded appropriately -- ERR or System	• Record review in the Description/

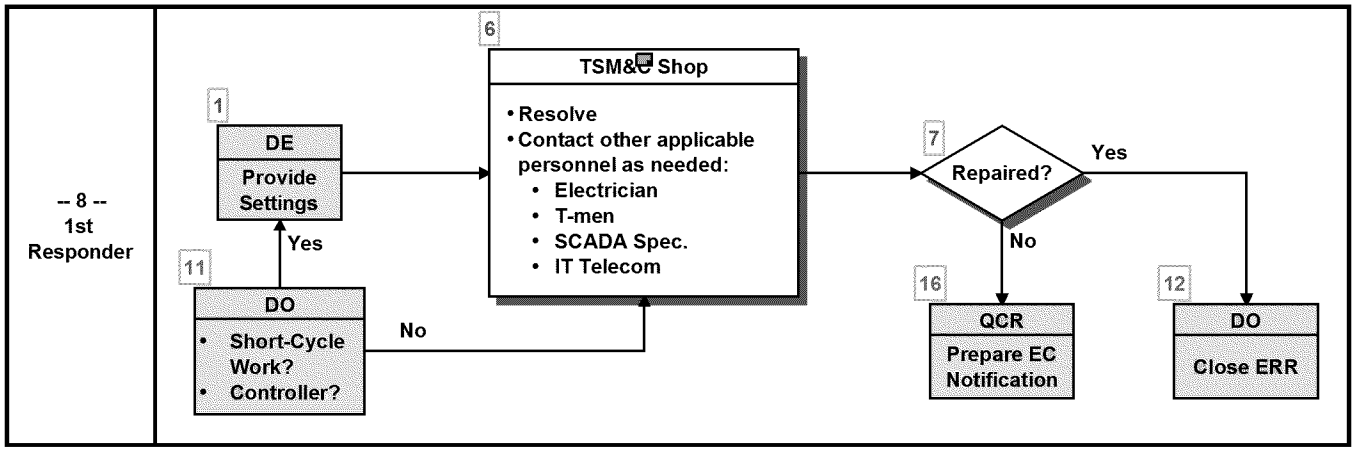
Box	Input	Task	Output
		Information List • Valid ERR? 2) For substation equipment: • Attention: "Substa-Antioch" or "Substa-Concord" • Substation radial is checked • Appropriate equipment type is identified 3) Review specific ILIS Fields: • Equipment Type • SCADA (yes/no) • Priority Code (see ILIS Guideline for Diablo Division Pilot, Table "Distribution ERR Priority Codes)" • Attention (ATTN) • Description 4) Validate scope of work 5) Additional review until the new ERR process is fully in place: • If the ERR can be resolved via the Short-Cycle process, ensure the "EPCM Tag" field indicates "N/A" and the ATTN field indicates "SCADA Specialist". (Note this is a 2nd check/transition until the new ERR process is in place. The new process entails the DO indicating N/A and the SCADA Specialist (TSM&C Equipment Shop SCADA) when the PIN is initially set-up.)	Progress field. • Initiate changes, if needed.
5	DE review of ERR	1) Document verification: In the Progress Notes, state: "Verified by Distribution Engineer". Any changes by the DE will be automatically tagged with LAN ID, date, and time. If other changes are needed, note the required changes in the Progress Notes and issue an email to the responsible party (see below). 2) No Changes • Done after completing Task 1. 3) Changes • Scope Changes: If scope needs to change, notify the Asset Strategist via email. • Changes to fields accessible by DE, specifically: i) Priority ii) EC Notification (number) iii) Planned Restore iv) Attention v) Progress Notes • Other Changes: For other changes, notify	• Verification documentation in Progress Notes • Changes to DE accessible fields, as needed • Email to Asset Strategist for scope changes AND identify such changes in the Progress Notes • Email to DO for other changes AND identify such changes in the Progress Notes

Box	Input	Task	Output
		the DO via email.	
C-106	**CONTROL – Distribution Engineer** Daily review of ERR and System Information List (SIL) for accuracy and completeness (see Box 3 tasks).		
C-107	**CONTROL – ORT** • Perform regular review of ERR with DE • Confirm DE's strategies and decisions		

Notes:

1) See References

8 - 1st Responder

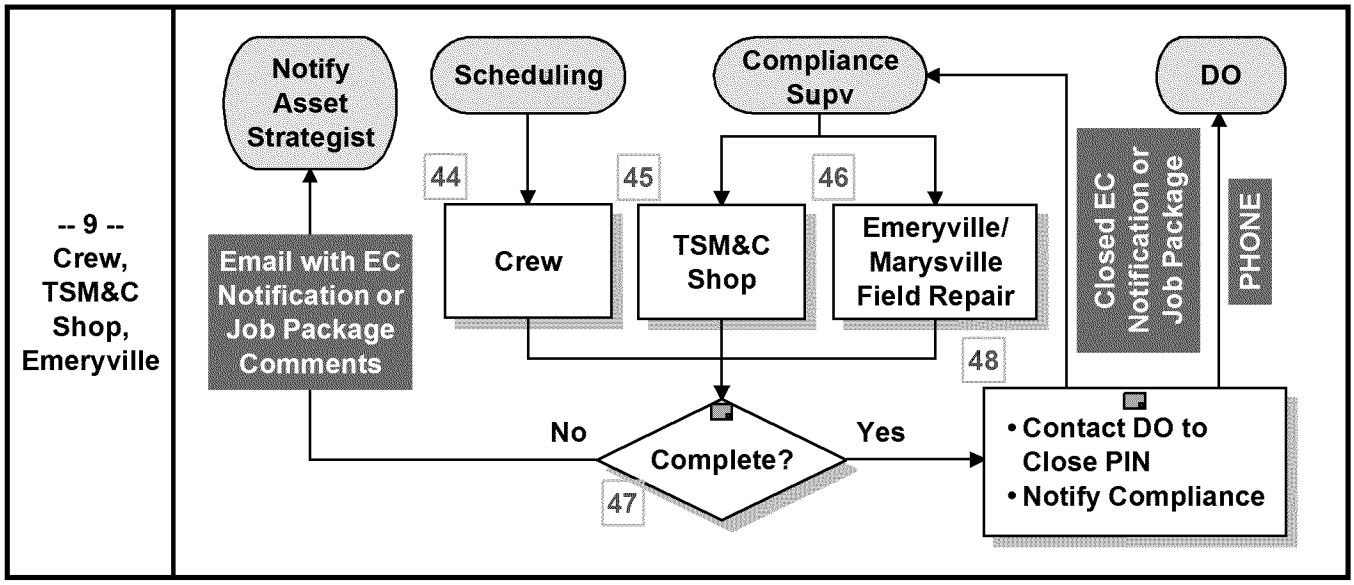


Task Descriptions

Box	Input	Task	Output
6	Dispatch from DO	1) Go to link \\ fairfield04\moms\PSOS_Document_Share\Standard_Job_Aids.pdf for the "Line Equipment First Response Troubleshooting Guide". • This troubleshooting guide combines with the recently revised "Standard Job Aids for Field Operations" from ECCO to create an integrated job aid for switching and trouble shooting to help troublemen restore equipment in the field. There are two goals: • Troublemen will be able to make 60% of the repairs with the help of this job aid, as 1st responders. • Equipment Shops, recently set up by TSM&C, will be able to make another 30% of the repairs. 2) If repairs can be made, notify DO. 3) If the repairs cannot be made as short-cycle work, prepare a EC Notification.	See Box 7
7	Completed work or evaluation by 1st responder	1) If short-cycle repair, notify DO to close PIN# 2) If not repaired, complete EC Notification	• Phone call to DO to close PIN OR • New EC Notification

Notes:

9 - Crews, TSM&C Shop, Emeryville/ Marysville

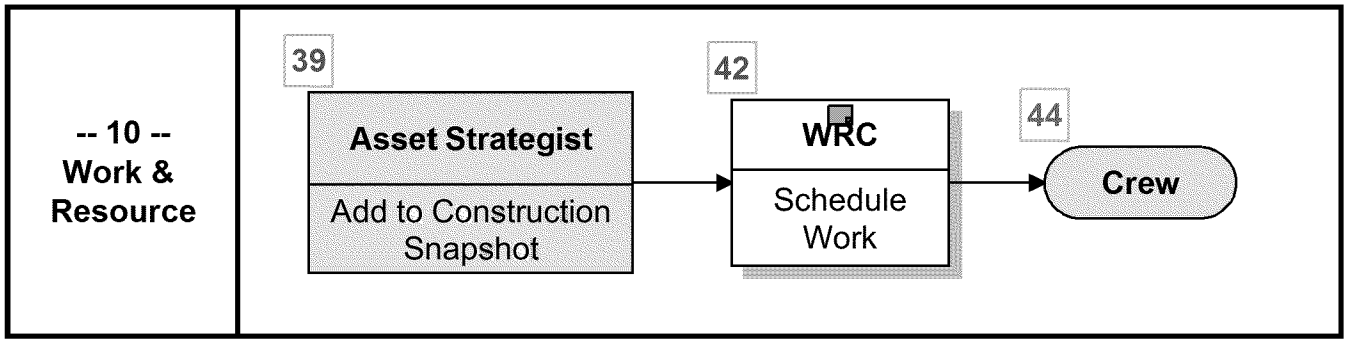


Task Descriptions

Box	Input	Task	Output
44-46	Complete work per applicable maintenance procedures		
47	• Completed (or cancelled) work package OR • Work revision	1) If work completed: • Contact DO to update ERR and close PIN# • Complete work package documentation 2) If work revision is needed: • Notify Asset Strategist via email with job package comments	• Work revision: email Asset Strategist • Completed/cancelled work: see Box 49
48	Completed (or cancelled) work package	1) Contact DO to update ERR and close PIN 2) Complete EC Notification or job package documentation and send to Compliance	• Sign-off Job Package (or EC Notification) and deliver to Compliance • Contact DO to close PIN

Notes:

10 - Work & Resource

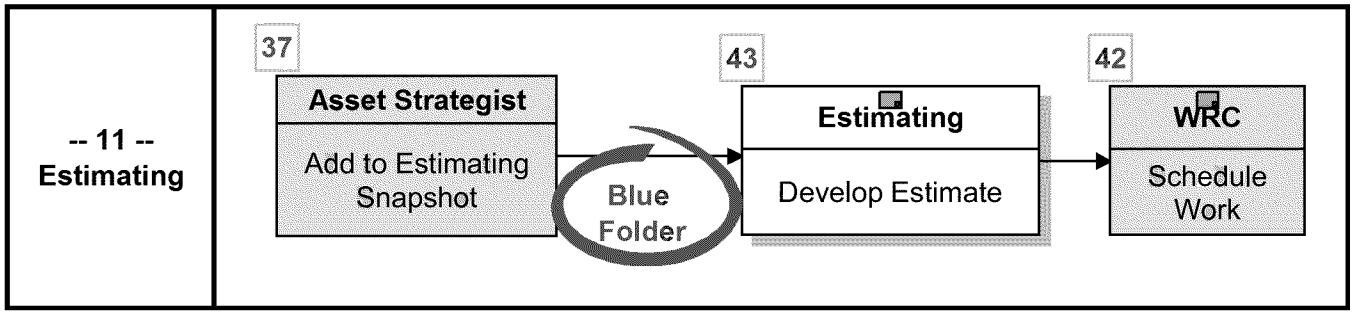


Task Descriptions

Box	Input	Task	Output
42	Construction snapshot from Asset Strategist	1) Schedule work per applicable procedures 2) Expedite P1 ERR (30-day) as "break-in" work and handle accordingly	Schedule for crew work

Notes:

11 - Estimating



Task Descriptions

Box	Input	Task	Output
43	"Blue Folder" from Asset Strategist	Prepare estimate per established procedures and processes.	Deliver estimate to WRC for scheduling

Notes:

ILIS Guidelines for Diablo Division Pilot

Table of Contents

Tables

Procedures when entering information into ILIS:

- It is imperative the equipment type selected is the one in fact to be repaired. Below are some procedures to follow:

  a) When the problem is cable, make sure you enter cable manually into the Equip. ID field (Cable)

  b) Make sure the Correct Equip. Type is checked before you close the file.

  c) When equipment is associated with SCADA, be sure to ask the T-man if the equipment can be put on “manual”. If not, the priority is a P1.

  d) Refrain from entering fuse changes on ERR. Instruct T-man to have correct fuse installed. This practice will prevent rework in the field. If inputting information into ILIS cannot be avoided, Be sure compliance is notified so immediate action is taken.

  e) If it determined by the T-man an elbow or splice is the root cause of the problem, document “Elbow” or “Splice” in the EQUIPID field and “Cable” in the Equipment Type field.

  f) When the equipment is inside the Substation fence/wall, “Substation” in the Attention field must be checked. Also be sure to select the Substation radial button.

TABLE 1-EQUIPMENT TYPE .V. ERR OR SIL

ILIS Equip Type	ERR List	System Info List
Capacitor Bank	If substation capacitor bank, be sure to check the ATTN Substation field. Otherwise use ATTN M&C	
Circuit Breaker	Be sure to check the ATTN Substation field.	
COIS	Don’t Use – instead use cable	Continue to delineate as a separate Equipment Type than cable.
Disconnect	If substation disconnects, be sure to check	

ILIS Equip Type	ERR List	System Info List
	the ATTN Substation field. Otherwise use Attention M&C	
Other	Try not to use. Instead select applicable Equipment Type.	
Regulator	If substation regulator, be sure to check the ATTN Substation field. Otherwise use ATTN M&C	
Transformer	If NG Cable, change to cable. If substation transformer, be sure to check the ATTN Substation field. Otherwise use ATTN M&C	
SCADA	IF SCADA related, be sure to check ATTN SCADA Specialist until "Attention To" drop downs change.	
Fuse **Interrupter** **Recloser** **Sectionalizer**	Use ATTN M&C	
Switch	If substation switch, be sure to check the ATTN Substation field. Otherwise use ATTN M&C	
Cable	If substation cable, be sure to check the ATTN Substation field. Otherwise use ATTN M&C	
Regulator **Auto Booster** **Booster**	If substation, be sure to check the ATTN Substation field. Otherwise use ATTN M&C	

- Be sure to communicate with the T-man or first responder to determine the best address description (it is good practice to make sure address on Notification and address in ILIS mirror each other).
- When creating a pin related to Regulators, Boosters, Step-Down and Step-Up banks, input name of equipment in the EQUIPID field.
- The PIN # must be established and communicated to the T-man or First Responder at the time PIN is created.
- Enter the initial priority code. (The Distribution Engineering Dept will validate it at later date.)
- Accurately document work completed and who performed the work(LanID) in the "Descr/Progress" field when creating and closing (add "closed-out" at end of comment when closing) an ERR pin. Also input "when" the repairs were made if different than the time stamp in ILIS.
- Inputting accurate, thorough and consistent information into the "Descr/ Progress" field is essential.
- When appropriate, change "Attention" field to the correct party.

a) If short-cycle work for Scada problems or battery replacement, select SCADA Specialist (Note, this is an interim selection, until ILIS is updated to reflect the TSM&C Equipment/Scada Shop).

b) If short cycle work for controller replacement, select the applicable Distribution Engineering work group.

c) If short cycle work for renumbering or fuses, select the applicable T-men work group.

d) If substation equipment, select the applicable Substation work group.

TABLE 2-DISTRIBUTION ERR PRIORITY CODES

Equipment Type	Criteria	Impact	New Priority Code for ERR(1)	Interim ERR Priority(1)
Cable (OH and UG mainline)	All mainline failures		G	1
Cable (UG local loop)	Peak loading exceeds equipments protective device minimum trip & therefore bypassed.		P1	1
Cable (UG local loop)	Other		P2	2
Capacitor	Voltage below Rule 2 limits without capacitor	Confirmed Voltage below Rule 2 limits	G	1
		Other	P1	1
	Power factor support	Summer	P1	1
		Winter	P2	2
Fuse Interrupter Recloser Sectionalizer	Safety & Compliance	Without device, upstream protective device cannot maintain end-of-line protection requirements per distribution protection handbook.	G	1
	Equipment bypassed or taken out of service. See SCADA category for functioning equipment with non functioning SCADA.		P1	1
Regulator Auto Booster	Voltage below Rule 2 limits without regulator.	Confirmed that Voltage below	G	1

Equipment Type	Criteria	Impact	New Priority Code for ERR(1)	Interim ERR Priority(1)
Booster		Rule 2 limits		
		Other	P1	1
	Emergency Voltage Support		P2	2
SCADA	Supports Reliability	Substation & Auto Transfer Schemes	P1	1
		Other	P2	2
Substation Equipment	Capacitor	Use Capacitor criteria above		
	Disconnects	Supports Reliability	P1	1
	Circuit Breaker. See SCADA category for functioning equipment with non functioning SCADA.	Supports Reliability	P1	1
	Other		P2	2
Switch	Supports Reliability. See SCADA category for functioning equipment with non functioning SCADA.	Mainline & Critical backties	P1	1
	Other		P2	2
Step Down (Transformer)	Supports Reliability and system integrity		P1	1
Other	Determine priority taking into account safety, impact to customers and probability of further outages.		G,P1, P2, P3	1 2 or 3
All Equipment	Equipment no longer needed. Write idle EC Notification and reason in ERR Progress/description section.		P4	4

(1) These are the new Priority Codes (consistent with the EC Notifications and BTF). For Distribution ERR the Priority Code options are: G, P1, P2, P3, or P4.

(2) These are the Priority Codes which are currently available in ILIS (until a programming change is made to reflect the new Priority Codes listed in Note 1 above). These Priority Codes (e.g., 1, 2, 3, 4) represent the Priority Codes per Bulletin 2007-10. Note, this Bulletin will be cancelled and replaced by a new Bulletin reflecting the new Priority Codes. New Priority Codes

ERR Priority Codes:

(Note: These priority codes are consistent with both the EC Notification and BTF.)

Priority G (Maintenance Compliance) – Necessary to maintain compliance. This is work that must be completed and can not be deferred. For ERR, examples include: critical mainline cable not put back in service during outage restoration (**Highly recommend repair/replace mainline cable within two weeks under emergency work order)**, capacitors offline where voltage may be or may fall below Rule 2 limits.

Priority P1 (Sys Repair/High Priority) – Necessary for system repair/improvement and have a high probability of impacting safety, reliability, or asset life. For ERR, examples include: fuses, interrupters, line

reclosers, sectionalizers, switches, capacitors (on a seasonal basis), regulators, disconnects, circuit breakers, substation, network; and SCADA.

Priority P2 (Sys Repair/Med Priority) – Necessary for system repair/improvement impacting safety, reliability, or asset life. For ERR, examples include: autobooster, booster, cable, jumpers.

Priority P3 (Sys Repair/Low Priority) – This is work deemed low priority and has little impact on safety, reliability, and asset life. Determine priority taking into account safety, impact to customers and probability of further outages.

Priority P4 (Equipment Not Needed or Idle) – Equipment no longer needed. Write idle EC Notification and reason in ERR Progress/description section.

DO Help List for Input in ILIS:

- **Save** - Saves the currently displayed record entry to the Database. If the Record is already existing it updates the record in the Database.
- **New** - Opens a New Out of Service Log
- **Close** - Closes the Currently displayed log and returns the user back to the ILIS home page.
- **Undo** - Will undo the last change to the currently displayed log as long as it was not saved
- **Print** - Displays a popup giving the user the option to print preview or send directly to the printer. Prints a formatted copy of the Out of Service log
- **Find** - The Out of Service log search screen is displayed.
- **Delete** - Deletes the currently displayed record
- **Locate in OIS** - Clicking on button will locate the Equipment ID or device on the OIS map if the device is in CEDSA.
- **Associated Event** - Field for entering Switching and/or Outage Event number associated with Out of Service record being created.
- **Type** -The condition of the equipment, Requiring repair if needs repair, System information if in abnormal state.
- **Date Out** - The Date that the condition being logged occurred. or is being reported,
- **PIN** - The PIN number assigned to the equipment (Ensure the PIN # is communicated with the T-man or first responder at the time the PIN # is created)
- **Active Box** - Flag indication if record is active or inactive. An active record indicates that the condition described in the entry still exists. An inactive record indicates that the condition described has been resolved and returned to "normal."
- **SCADA** Problem -Flag indication if record is related to SCADA. (If a SCADA device is associated with the equipment, this box must be checked)
- **Equip ID** - The equipment which is in need of repair or in abnormal condition. Entries that are in CEDSA will auto populate the Circuit, District, Equipment type, and equipment location.
- **District** - The District where the equipment is located.
- **Circuit** - The circuit where equipment or condition being reported is located.
- **Equip Type** - The type of equipment in need of repairs or in an abnormal condition. (Equipment type must be accurate. If the problem is a cable problem, ensure cable is

checked, not the type of equipment that is it associated with.)

- **Equip Address** - The geographic location of the equipment entered in the EquipID field. (Must communicate with the T-man or first responder to ensure the best address is used)
- **Date** - The date the Out of Service log item is/was created or reported, 'd' will insert the current date in the textbox, '+' will increase the date by a day,'-' will decrease the date by a day and 'w' will increase the date by a week.
- **Time** - The time the Out of service log is/was created or the report was made from the field.
- **Description** -A description log item containing pertinent information on the condition or the equipment and person reporting. (It is crucial all the information is accurate to the abnormality).
- **Attention** - The name of the department to whose attention is required.
- **Created** - Corp Id, Date and time that the Out of Service log item was created Last Updated - The Corp Id, Date, time of the last update
- **Date Restored** - Date Restored, when date is entered will make the log inactive in the database and remove it from the list of active entries.
- **Priority** - List of priorities available for the entry with a short descriptive test of the priority criteria (New list of Priority Codes have been created as a result of BTF. See ILIS guide).
- **Date Plan/Restore** - If the date the equipment is due to be restored is known, it is entered in the Date Plan/Restore field.
- **EM notification Field for entering EM notification number**
- **Refresh** - Refreshes the Out of Service Log Records Grid with updated records.
- ">" Zoom Out of Service Log Records Grid to display more records "+" Increase row height "-" Decrease row height
- **Sort by Date** - Sort the Grid by Date Ascending.
- **Sort by District** - Sort the Grid by District Ascending.
- **Out of Service Log Grid** - Displays all active Out of Service log entries can click on header to each page by Any column
- **Pages** - Displays how many pages of active items exist with links to each page