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GAP ANALYSIS REPORT

*<NATIONAL FIBER NETWORK'S NOC> Assessment Findings,
Evaluations and Recommendations*

Submitted to:

<Executive Sponsor>

Vice President Technical Solutions

<Client name>

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Gap Analysis

<NATIONAL FIBER NETWORK'S NOC> Assessment Findings, Evaluations, and Recommendations

EXECUTIVE SUMMARY

This report presents a compilation of the results of a detailed inquiry into the operations processes, systems and policies of the NOC facilities of <NATIONAL FIBER NETWORK> at both Indiana University and <WESTERN STATE AGENCY NOC>.

Study Objectives

The objective of this engagement was twofold:

- to develop a sufficiently detailed understanding of the incumbent processes and systems utilized by the NOC
- to evaluate the degree of compliance with recognized commercial standards of capabilities and performance of the services that are offered through, or supported by, those processes and systems.

Evaluation Standards

We elected three sources for the norms¹ against which we evaluated the features and attributes of the <NATIONAL FIBER NETWORK'S NOC>'s processes and systems:

- industry standards regarding network management function designations and objectives, as embodied in the [International Telecommunications Union ITU-T M3400 Series](#) on Telecommunications Management Network (TMN)
- industry-recognized "best practice" recommendations regarding IT operations and infrastructure, as embodied in the [Information Technologies Infrastructure Library, Version 3 \(ITIL V3\)](#)
- Augury Network Advisors' collective experience of more than thirty years with design, implementation, and operation of commercially oriented managed network services and network management facilities.

¹ A useful introduction to several industry-recognized norms in network management will be found at http://www.openwatersolutions.com/docs/FCAPS_TMN_%20ITIL.pdf.

Identified Gaps

The inquiry and consequent assessment identified eight specific significant “gaps” in <NATIONAL FIBER NETWORK’S NOC>’s conformance to these widely accepted norms in commercially oriented network operations. These gaps include:

1. Network device monitoring strategy that is limited to polling only
2. Insufficient automation between the event management and ticket management systems
3. Inadequate functionality available to customers in the web portal to the ticket management system
4. Limited management visibility to key performance indicators for services
5. Performance commitments to customer notification of newly detected network problems that exceed typical requirements
6. Lack of periodic comprehensive testing of business continuation and disaster recovery plans
7. Lack of formal Service Level Agreements that serve to specify <NATIONAL FIBER NETWORK’S NOC> performance commitments and terms, and to specify unique customer requirements
8. Reluctance to implement patch panels in network node equipment installations, impacting network interconnection, demarcation identification, and cabling flexibility

Identified Deficits

In addition to these gaps, we also identified 26 specific “deficits” in either the processes or systems capabilities as evaluated against these same norms. We propose that these deficits, while real, are not of the same caliber, scope or significance as the aforementioned gaps, and reflect a matter of degree of conformance, as opposed to a relatively clear-cut discrepancy, to the norms. In brief, the scope of these deficits in operations encompasses issues in:

- Fault management
 - Absence of an explicit focus on Applications Management² processes
 - Incorporation of customer-driven criteria for criticality or severity
 - Specification of unique customer escalation criteria
 - Single process for qualifying new device type alert/alarm behaviors
- Ticket management
 - Subtle time-stamp distinctions
 - Absence of SLA-based service commitments
 - Broader scope of data elements in problem reporting
 - Account administration of customer accessible web portal
- Escalation management
 - Absence of SLA-based specifications and criteria
- Vendor management
 - Absence of SLA-based vendor commitments
 - Lacking an explicit Supplier Management³ role in NOC staff

² In ITIL, Applications Management specifically guides how business applications are developed, managed, improved, and when necessary, sunset from a “lifecycle” perspective: Gather Requirements – Design – Build and Test (the “Development Phase”) and Implement – Operate - Optimize (the “Service Management Phase”). The identified deficit is with respect to the NOC applications software environment overall.

- Troubleshooting and diagnostics
 - A substantial variance between the two operations centers with regard to the technical staff's familiarity, utilization, and reliance on the key element manager systems, namely Cisco Transport Manage [CTM] and Cisco Transport Controller [CTC]),
 - Lack of emphasis on staff attainment of industry-recognized technical certifications
 - Minimum annual commitments to staff technical training
- Planned events
 - Engaging customer input in network event planning
- Business Continuation – Disaster Recovery
 - Recording results of BC-DR testing events
- Change management
 - Engaging customer input in change review proceedings
- Configuration backup
 - Verification of management access to devices following configuration changes
- Preventative security
 - Additional key card reader at <WESTERN STATE AGENCY NOC>
 - Pre-employment requirements
 - Periodic review of authentication credentials
- Provisioning
 - Lack of focused organization or system to manage provisioning activities
 - Data comprising new service order specifications
- Management staffing
 - Individual accountability for strategy development and management

Recommendations

In this report, we will offer specific and, in some cases, multi-point recommendations that address remediation of the observed operational gaps, as well as the operational deficits. In general, our recommendations fall into three categories:

1. System revisions: for example, enabling a greater degree of automation between the event management and ticket management systems
2. Policy revisions: for example, in adopting the use of effective Service Level Agreements in defining service commitments and performance characteristics
3. Process revisions: for example, aggressively pursuing more rigorous and comprehensive testing of the business continuation and disaster recovery plans of record, and routinely reviewing results for the sake of continuous process improvement

Conclusion

Overall, we believe that the fundamental capabilities of <NATIONAL FIBER NETWORK'S NOC> are well designed and effectively executed. However, we have also determined that the identified operational

³ ITIL specifies an explicit, individual role of "Supplier Manager", responsible for ensuring that value for money is obtained from all suppliers. While evident in <NATIONAL FIBER NETWORK'S NOC> operations, the deficit was noted in it being a responsibility divided across multiple managers and individual contributors, rather than as a role-based accountability.

gaps could present a significant risk to the degree to which market acceptance of the portfolio of managed network services offered by <client name> is extended.

Furthermore, we acknowledge that our recommendations for remediation represent only potential solutions to these issues, and could be preempted by alternative approaches developed in partnership by National LambdaRail Consortium and <client name>.

BACKGROUND

In its core business pursuit of commercializing high-capacity bandwidth services, <client name> will be critically dependent on the network management and operations capabilities that are provided by the incumbent NOC Services from the <NATIONAL FIBER NETWORK> Consortium. In the remainder of this report, that facility will be referred to collectively as the <NATIONAL FIBER NETWORK'S NOC>.

<client name> initiated a consulting engagement with Augury Network Advisors, LLC in order to obtain a 3rd party, impartial analysis from a group to research the capabilities at a detailed level of <NATIONAL FIBER NETWORK> 's network operations facilities.

Network monitoring and management functions in the areas of the <NATIONAL FIBER NETWORK> are provided by a collaborative operations group that includes the <university NOC> and the <western state agency NOC>.

METHODOLOGY

Overall Plan

We used a straightforward method to discovering and evaluating the <NATIONAL FIBER NETWORK'S NOC> Current Mode of Operations (CMO) operations.

1. Survey
2. Survey response clarification and verification
3. NOC site tour
4. Research of industry standards and best practices
5. Review and evaluation
6. Recommendations

Survey

Augury developed a survey of 201 direct and follow-on questions that was submitted to <NATIONAL FIBER NETWORK'S NOC> management for a team-developed response. The responses to those survey questions were collected and compiled into a small database.

Scheduled Meetings

Several face-to-face meetings were conducted with management and staff members of the <NATIONAL FIBER NETWORK'S NOC>, including visits to the two principal network operations center facilities providing support for Layer 1 and Layer 2 services of the <NATIONAL FIBER NETWORK> : the <UNIVERSITY NOC>, and the <WESTERN STATE AGENCY NOC> NOC in <location>.

Meetings details are summarized in Table 1, below.

Date	Location	Participants
14 April 2009	O'Hare Hilton, Chicago IL	<attendee list>
18 May 2009	<UNIVERSITY NOC>	<attendee list>
21 May 2009	<WESTERN STATE AGENCY NOC> NOC,	<attendee list>

Evaluation Method

We scored the information that was compiled into one of three classes of conformance:

1. Full conformance
2. Partial conformance
3. No conformance

Full conformance

Survey items that we determined were fully conformed, or even exceeded, one or more of the designated norms have been noted as such in the database compilation of our findings.

Although we did not incorporate any of those observations in this report, since they should not represent any issues for <client name>'s anticipated market acceptance or operational adequacy, we wish to note, indeed emphasize, that we found that many features of the <NATIONAL FIBER NETWORK'S NOC> operations processes exhibited thoughtful design, careful planning and attention to detail. Furthermore, the skill and acumen of both the management and the technical staff with whom we met consistently demonstrated technical proficiency and engineering elegance which is undoubtedly reflected in the caliber of services that are delivered in day-to-day operations.

It would be quite reasonable for us to assume that the <NATIONAL FIBER NETWORK>'s base of legacy customers is pleased and satisfied with the service and capabilities currently fulfilled by the <NATIONAL FIBER NETWORK'S NOC> operation. It should also be noted that <NATIONAL FIBER NETWORK>'s customer base is comprised of research and educational institutions and not commercial enterprise corporations. As stated, the objective of this study is to identify aspects of the current mode of operations that might adversely impact the ability of <client name> to compel new, demanding commercial customers to examine, consider, and purchase managed network services. To that end, the satisfaction of legacy customers is indicative of the <NATIONAL FIBER NETWORK'S NOC>'s operating efficacy, but in this assessment our focus on potential issues takes precedence.

Partial conformance

Survey items that we determined demonstrated some degree of conformance to one or more of the indicated norms are consolidated as "operational deficits". While they represent gaps, in the strictest sense, between the observed practice and the designated norms, we felt that either the degree of conformance, or the overall significance of the particular characteristic did not warrant a priority consideration. In a sense, addressing these issues might be "nice to do", but we would not consider them as "must haves".

No conformance

Survey items that we determined were characterized by insubstantial conformance to either standard, best practice, or our own practical experience are the substance of "operational gaps" that we set out to identify, and are enumerated in the section **Findings and Evaluations: Operational Gaps Summary**, below.

To put the significance of the "no conformance" evaluation into a more practical perspective, we believe that the lack, in aggregate, of such features would be viewed as a substantial obstacle to meeting requisite levels of service performance that generally underpin commercial customer's expectations of high-value managed network services. In other words, if these discrepancies were to remain unresolved we would expect many prospective commercial customers to conclude that <client name>'s service offerings could not meet commercially acceptable standards of performance.

Standards and Best Practices

An evaluation of anything must be made against some sort of norm. For the purpose of this assessment, we identified two sources of industry-recognized authority for comparison purposes. In addition, we are relying on the collective experience of Augury Network Advisors in managing network operations centers as the basis for determining useful, productive practices.

Current Mode Validation

The overall time constraints of this assessment project precluded conducting a corresponding process of comprehensively auditing all aspects of the <NATIONAL FIBER NETWORK'S NOC>'s current operations practices.

All descriptions of methods, procedures, conventions, and standards that were related verbally by <NATIONAL FIBER NETWORK> managers and staff members were presumed complete and accurate. Wherever feasible, information that was provided to us in this manner was noted and such notes subsequently submitted to <NATIONAL FIBER NETWORK> for review and revision, in order to ensure an accurate portrayal of the discussion items.

All such information was taken into consideration, with regard to our evaluation, strictly at face value without corroborative direct observation of the current mode of operations in the <NATIONAL FIBER NETWORK'S NOC>.

FINDINGS AND EVALUATION RESULTS

Operational Gaps Summary

Our assessment led us to identify seven characteristics of the <NATIONAL FIBER NETWORK'S NOC> operations that we believe fall substantially short of either established international standards, industry-recognized best practices, or the practical experience of Augury's consultants. These characteristics are listed in Table 2 - Operational Gaps, below, under the column *Gap Description Summary*.

Recommendations For Gaps Remediation

Identifying operational gaps is the first critical step and gaps are usually easily identifiable. The real work comes with devising, planning, and implementing effective solutions toward remedying these issues.

In the column *Gap Remediation Recommendations* in Table 2 - Operational Gaps, we offer a compilation of recommendations for addressing each of the identified gaps. In all cases, our goal was to propose an approach toward remediating an identified gap in alignment with industry standards effective for industry services. As stated earlier in this report, we want to emphasize that our recommendations for remediation represent only one set of potential solutions to these issues, solutions which could be preempted by alternative approaches developed through a National LambdaRail and <client name> collaboration.

Table 2 - Operational Gaps, below, summarizes our evaluation conclusions with regard to operational **gaps**.

Gap Number	Related to Survey Items	Gap Description Summary	Gap Remediation Recommendation
Fault Management			
1	1.1.1.I	Monitoring strategy is limited to polling only, and does not encompass collection and processing of device-initiated traps	1) Review <NATIONAL FIBER NETWORK> event collection strategy and consider a risk/cost/impact analysis of implementing a "trap and polling" approach, with respect to commercial customers and services.
Ticket Management			
2	1.1.2.D, 1.1.2.F, 1.1.2.AA	The interface between the event management system and the ticket management system is "semi-automated", and does not provide the degree of automatic status updates of open tickets based on detected changes reported from a network device.	<p>2) Design and implement a bi-directional interface between Alertmon (event management system) and Numera Footprints (ticket management system), enabling automatic generation of a new ticket based on flexible business rules regarding severity/criticality.</p> <p>Other features of this interface would include:</p> <ul style="list-style-type: none"> - ticket would be enriched with pertinent data from Alertmon such as customer, circuit, event creation data and time, and - ticket ownership assigned to Alertmon - ticket ID would be returned to Alertmon from Footprints - as state changes for that event occur, subsequent updates would be sent from Alertmon back to Footprints. <p>(Also partially addresses Gap #3 and Gap #4, below)</p>

3	1.1.2.I, 1.1.2.J	Web portal access to the ticket management system provides limited functional capabilities to external customers who prefer using that mechanism as the primary means of coordinating and managing information with the <NATIONAL FIBER NETWORK'S NOC>.	3) Design and implement an expansion of the current web portal functions to allow commercial users the ability to submit, update and view tickets in their entirety. 4) Consequent to #1 above, implement automated processes to notify Service Desk resources when a change has been made to a customer's ticket.
4	1.1.2.MM, 1.1.2.NN	The operational perspective regarding tracking and reviewing service performance indicators of the <NATIONAL FIBER NETWORK'S NOC>'s service delivery is limited, and not in keeping with current industry conventions in service quality management. ⁴	5) Review and consider the cost/benefit of incorporating the full scope of ITIL V3 recommended key performance metrics into the current functionality of Alertmon and Footprints. 6) Review and consider the cost/benefit of adopting a program of continual customer satisfaction and feedback surveys
5	1.1.2.U	<NATIONAL FIBER NETWORK'S NOC>'s customer notification target timeframes do not coincide with typical expectations of commercial network customers, nor are the commitments specified in Service Level Agreement.	7) Since a 30-minute event notification window will not satisfy commercial requirements, we recommend adopting a standard fifteen minute maximum notification window (an established commercial standard) with notifications typically occurring in less than 10 min. Understandably, with such windows the <NATIONAL FIBER NETWORK> may not be able to provide <client name>/INOC with extensive event/fault detail on a "first call". <u>This is an acceptable tradeoff</u> . In our experience, the failure to notify the customer as early as possible following a detected fault, despite an incomplete diagnosis, eventually prompts serious questioning of service value. The goal should be to notify the customer before the customer detects the problem through their own facilities, or hears about it from their own user community.
BC-DR Plans			
6	1.1.8.E, 1.1.8.F	Periodic, comprehensive testing of the <NATIONAL FIBER NETWORK'S NOC>'s Business Continuation and Disaster Recovery Plans does not appear to be sufficiently routine, adequately integrated, and appropriately documented to ensure that the system could withstand the impact of a catastrophic failure or disaster.	8) In close collaboration with <client name>, as representative of commercial customer needs, devise and annually conduct a comprehensive test of the BC-DR plan. 9) Ensure the collection, recording, retention and internal management review of detailed results from such testing. 10) Initiate an audit and review by an external party of the first instance of the BC-DR test.
Performance QA			

⁴ ITIL V3 defines a Continuous Service Improvement (CSI) process that is characterized by a family of Key Performance Indicators tracking service and process evaluation feedback via ongoing customer surveys, and leading to specific Improvement Initiatives. For more see http://wiki.en.it-processmaps.com/index.php/ITIL_V3_CSI_-_Continual_Service_Improvement

7	1.3.1.B	Operations at the <NATIONAL FIBER NETWORK'S NOC>, although clearly aware of the preeminence of customer satisfaction, does not employ Service Level Agreements as a vehicle for precisely specifying commitments regarding the performance characteristics of the services that it offers. This strategic choice does not conform to the widely established use of formal, written Service Level Agreements between network service providers and commercial customers of managed network services, and could conceivably hamper market acceptance of network services that are fulfilled through <NATIONAL FIBER NETWORK>'s facilities for <client name> commercial customers.	<p>11) Review and consider the risk/cost/benefit of adopting the use of effective Service Level Agreements in support of commercial customers.</p> <p>12) Solicit input from commercial customers and commercial prospects regarding SLA features and terms.</p> <p>13) Engage a third party to develop effective Service Level Agreement templates as elements in routine services subscriptions</p>
8	1.5.1.A	<NATIONAL FIBER NETWORK>'s practice of supporting a direct physical cable connection of a cross-connect cable from an interface cards of its optical node, without an intervening patch panel, and leading directly to customer equipment does not conform to industry-recognized practices regarding structured cabling design.	14) Modify current implementation practices to include a patch panel component as the connection point for cross-connect cabling, and serve as the network demarcation point of the <NATIONAL FIBER NETWORK> service delivery.

Table 2 - Operational Gaps

Operational Gap Details

Individual gaps in <NATIONAL FIBER NETWORK'S NOC> practices are detailed on the following pages, on an item by item basis. They are organized according to the same categories that were first established with the survey questions.

Each item in the Gap Details section is formatted as follows:

- Survey Question ID: refers to the question's identification number assigned in the initial questionnaire distributed in March, 2009. The question is restated, followed immediately by the answer values (in italics). Wherever multiple choices were available in the questionnaire, all items that were checked in the <NATIONAL FIBER NETWORK> response are included here, while unchecked items are not listed.
- Evaluation: this segment contains our detailed assessment of the item response
- Reference Standards: as discussed at the beginning of this report, the established industry norms contained in the recommended ITU-T TMN model and the operating recommendations contained in ITIL Version 3, wherever applicable, are identified. Wherever either recommendation is silent on a particular point, the space under the title remains blank. The Practical Experience norm is derived from the first-hand experience of either or both of the contributing Augury consultants.

FAULT MANAGEMENT

Survey Question ID: 1.1.1.I

Characterize the event categories that are monitored and processed in your fault management strategy. Check all that apply.

Threshold crossings

Polled alarms

Polled MIB objects

Evaluation:

We recognize that <NATIONAL FIBER NETWORK> 's initial attempts to manage the network through device trapping were less than successful.

However, the TELECOMMUNICATIONS MANAGEMENT NETWORK Standard addresses event monitoring functionality for "near-real time alarm origination and reporting by an Network Element", and the consultant's practical experience strongly recommends a monitoring strategy that encompasses "device initiated traps" along with periodic device polling for alerts.

We support and endorse the practice of event data collection by combining trap collection and polling, and advocate the approach as an efficient method.

Although device-initiated traps, which are based on the UDP, are not guaranteed for delivery to the management station, the practical probability of receipt can be increased through a robust management network. Event notifications via device traps that are missed will be still be retrieved through the polling process, guaranteed by virtue of a more robust protocol. However, the consultant believes that the combination of these two processes provides both early detection and event delivery assurance.

This item does not adequately reflect or conform either to recognized industry best practices, or to the practical operations experience of the consultants.

Reference Standards

ITU-T TELECOMMUNICATIONS MANAGEMENT NETWORK (TMN):

Alarm surveillance:

- (1) near-real time alarm origination and reporting by an NE
- (2) alarm querying of the NE
- (3) logging and retrieval of historical alarms [ITU-T Rec M.3400]

INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY (ITIL) V3:

Service Operation - Event Management specifies the utility of event categorization and correlation criteria and operating rules.

Sub-process "Event Filtering and Categorizations" objective is to "filter out Events which can be ignored, and to assign categories to Events indicating their significance".

While Event categorization is advocated, specific categories and their criteria are not defined.

Practical Experience:

Device Initiated traps
Process initiated traps
Polled alerts

Threshold crossings
Polled alarms
Polled MIB objects

TICKET MANAGEMENT

Survey Question ID: 1.1.2.AA

Is the status of a ticket updated automatically by the fault management system?

No

Evaluation:

As initially noted in item 1.1.2.D, we find that <NATIONAL FIBER NETWORK> tickets are opened "semi-automatically", but the procedure is manually initiated given notifications received from Alertmon, phone requests, emails or web-form submissions. However, we strongly advocate the availability of a fully automated interface between the event management system and the ticketing system, in part to facilitate the determination and reporting to customers of circuit facility availability. Furthermore, we anticipate that such an interface design would enable and support ongoing event status updates to be automatically applied to appropriate open tickets, as well as enabling automation of overall ticket status.

This item does not adequately reflect or conform either to recognized industry best practices, or to the practical operations experience of the consultants.

Reference Standards

ITU-T TELECOMMUNICATIONS MANAGEMENT NETWORK (TMN):

INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY (ITIL) V3:

Not specified or explicitly required

Practical Experience:

Yes

TICKET MANAGEMENT

Survey Question ID: 1.1.2.D

What are the various ways for a customer to manually open a new case or ticket in the system?

1. *Phone Call*
2. *Email*
3. *Web form*

Evaluation:

We noted that <NATIONAL FIBER NETWORK> tickets are opened "semi-automatically", but the procedure is manually initiated given notifications received from Alertmon, phone requests, emails or web-form submissions. However, we strongly advocate the availability of a fully automated interface between the event management system and the ticketing system, in part to facilitate the determination and reporting to customers of circuit facility availability.

This item does not adequately reflect or conform either to recognized industry best practices, or to the practical operations experience of the consultants.

Reference Standards

ITU-T TELECOMMUNICATIONS MANAGEMENT NETWORK (TMN):

INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY (ITIL) V3:

Recommendation does not specify requirements for alternative methods to initiate an event or incident process, but it does imply that both automated and manual methods are available as IT service mechanisms. The convention also advocates continuous monitoring of service availability.

Practical Experience:

- (1) automatic detection
- (2) phone report by customer
- (3) web form
- (4) email

TICKET MANAGEMENT

Survey Question ID: 1.1.2.F

Can new cases be opened or created in the ticketing system through an automatic process on detecting a problem?

Yes

Evaluation:

We noted that <NATIONAL FIBER NETWORK> tickets are opened "semi-automatically", since the procedure is manually initiated once given notifications that are received from Alertmon, phone requests, emails or web-form submissions. However, we strongly advocate the availability of a fully automated interface between the event management system and the ticketing system, in part to facilitate the determination and reporting to customers of circuit facility availability.

This item does not adequately reflect or conform either to recognized industry best practices, or to the practical operations experience of the consultants.

Reference Standards

ITU-T TELECOMMUNICATIONS MANAGEMENT NETWORK (TMN):

INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY (ITIL) V3:

The capability to conduct rule-based filtering and correlation of automatically detected incidents is explicitly defined.

Practical Experience:

Yes

TICKET MANAGEMENT

Survey Question ID: 1.1.2.I

If "yes" above, which general functions are qualified remote users authorized to conduct in the ticketing system?

1. Other functions

Evaluation:

<NATIONAL FIBER NETWORK> ticket management system provides only some of the functionality that, based on experience, we believe are essential to a commercial customer's web portal access. This is frequently a marketing requirement of commercial customers, providing a competitive advantage against other suppliers or carriers.

Furthermore, we have observed that a relatively small subset of customers will use a web portal with great diligence, motivated by the benefits of the efficiencies that it provides. Typically, these customers will expect a full range of functional capabilities be made available through this interface.

This item does not adequately reflect or conform either to recognized industry best practices, or to the practical operations experience of the consultants.

Reference Standards

ITU-T TELECOMMUNICATIONS MANAGEMENT NETWORK (TMN):

INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY (ITIL) V3:

Practical Experience:

Minimum functions include:

1. Create tickets
2. Add journal entries
3. Update administrative details
4. Update ticket status
5. Close tickets

TICKET MANAGEMENT

Survey Question ID: 1.1.2.J

If "other functions" are allowed, please describe.

View ticketing status and updates.

Evaluation:

In the consultant's experience, commercial customers present a wide and sophisticated range of expectations of the capabilities of a managed service vendor's customer-accessible web portal access to its operations support environment and systems. Flexible problem status reporting, active and passive notification of planned network events and maintenance activities, and extensive management summary reporting are typical expectations.

The limits of the web portal access to the ticketing system that are currently available are potentially significant shortcomings to the <NATIONAL FIBER NETWORK> NOC service offering.

This item does not adequately reflect or conform either to recognized industry best practices, or to the practical operations experience of the consultants.

Reference Standards

ITU-T TELECOMMUNICATIONS MANAGEMENT NETWORK (TMN):

INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY (ITIL) V3:

Practical Experience:

1. User specified reports
2. Planned maintenance scheduling
3. Extensive management reporting

TICKET MANAGEMENT

Survey Question ID: 1.1.2.MM

Are key performance statistics describing ticketing activity in the NOC routinely reported to the NOC's management staff?

Yes

Evaluation:

We find that the <NATIONAL FIBER NETWORK'S NOC> offers a very limited perspective regarding service performance metrics. ITIL V3 recommendations, that have been corroborated in our practical experience, define a variety of key metrics in order to adequately characterize service performance of a managed network service provider.

We also note that the <NATIONAL FIBER NETWORK'S NOC> ticketing system is fundamentally capable of tracking and recording such key performance indicators, but

would likely require extensive modifications in order to be sufficiently integrated with the Alertmon system to enable their compilation and use.

This item does not adequately reflect or conform either to recognized industry best practices, or to the practical operations experience of the consultants.

Reference Standards

ITU-T TELECOMMUNICATIONS MANAGEMENT NETWORK (TMN):

INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY (ITIL) V3:

Recommendation defines extensive Key Performance Indicators for Service Operations - Incident Management and Problem Management processes

Practical Experience:

Yes

TICKET MANAGEMENT

Survey Question ID: 1.1.2.NN

If "yes", please indicate which statistics are encompassed in the routine reports. Check all that apply.

1. *New tickets, by severity*
2. *Closed tickets*
3. *First call resolutions*
4. *Other*

Evaluation:

We find that the <NATIONAL FIBER NETWORK'S NOC> offers a very limited perspective regarding service performance metrics. ITIL V3 recommendations, that have been corroborated in our practical experience, define a variety of key metrics in order to adequately characterize service performance of a managed network service provider.

We also note that the <NATIONAL FIBER NETWORK'S NOC> ticketing system is fundamentally capable of tracking and recording such key performance indicators, but would likely require extensive modifications in order to be sufficiently integrated with the Alertmon system to enable their

compilation and use.

This item does not adequately reflect or conform either to recognized industry best practices, or to the practical operations experience of the consultants.

Reference Standards

ITU-T TELECOMMUNICATIONS MANAGEMENT NETWORK (TMN):

INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY (ITIL) V3:

Incident Management -

1. # of repeated incidents,
2. remotely resolved incidents,
3. # escalations,
4. # incidents,
5. incident resolution time,
6. first time resolution rate,
7. resolution within SLA,
8. incident resolution effort

Problem Management:

1. # problems,
2. problem resolution time,
3. # incidents per problem,
4. # incidents per known problem,
5. time until problem identification (root cause),
6. problem resolution effort.

Practical Experience:

1. New tickets, by severity

TICKET MANAGEMENT

Survey Question ID: 1.1.2.T

Are service performance metrics monitored and reported on a regular basis? Check all that apply.

Problem Duration

Evaluation:

We find that the <NATIONAL FIBER NETWORK'S NOC> offers a very limited perspective regarding service performance metrics. ITIL V3 recommendations, that have been corroborated in our practical experience, define a variety of key metrics in order to adequately characterize service performance of a managed network service provider.

We also note that the <NATIONAL FIBER NETWORK'S NOC> ticketing system is fundamentally capable of tracking and recording such key performance indicators, but would likely require extensive modifications in order to be sufficiently integrated with the Alertmon system to enable their compilation and use.

This item does not adequately reflect or conform either to recognized industry best practices, or to the practical operations experience of the consultants.

Reference Standards

ITU-T TELECOMMUNICATIONS MANAGEMENT NETWORK (TMN):

INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY (ITIL) V3:

Service Operations core discipline specifies Key Performance Indicators for Incident Management and Problem Management.

Incident Mgmt KPI's:

1. # repeated incidents,
2. remotely resolved incidents,
3. # escalations,
4. # incidents,
5. incident resolution time,
6. first time resolution rate,
7. resolution within SLA,
8. incident resolution effort

Problem Mgmt KPI's:

1. # of problems, problem resolution time,
2. number of incidents per problem,
3. number of incidents per known problem,

4. time until problem identification,
5. problem resolution effort

Practical Experience:

1. Time to respond
2. Time to repair
3. Time to notification

4. Time to resolution
5. Time to dispatch
6. Problem Duration

TICKET MANAGEMENT

Survey Question ID: 1.1.2.U

In the past 30 days, what is the average or typical response time for customer notification following the detection of a severe problem through the fault management system?

30 minutes. This time could be shortened but only with an increased risk of false positive reporting.

Evaluation:

We find that the <NATIONAL FIBER NETWORK'S NOC> notification performance targets do not conform to our practical experience of SLA-based commitments for customer notification, typically fifteen minutes or less. We believe that <client name>'s commercial customers are unlikely to find a 30-minute initial notification limit to be satisfactory.

This item does not adequately reflect or conform either to recognized industry best practices, or to the practical operations experience of the consultants.

Reference Standards

ITU-T TELECOMMUNICATIONS MANAGEMENT NETWORK (TMN):

INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY (ITIL) V3:

Practical Experience:

5 - 15 minutes, per service agreement

BC-DR PLANS

Survey Question ID: 1.1.8.E

Under management direction, are both the BCRP and D/R plans periodically tested by NOC technical staff?

N/A

Evaluation:

We find that the <NATIONAL FIBER NETWORK> 's complete BC-DR plan is not adequately exercised and tested on some regular, periodic basis, although we noted that various physical components of both the <UNIVERSITY NOC> and <WESTERN STATE AGENCY NOC> NOC, such as backup generators, are periodically subject to isolated functional testing.

Candidly, we were unable to determine confidently that comprehensive, complete plans ensuring Business Continuation and Disaster Recovery are available in <NATIONAL FIBER NETWORK> , and that they could be rigorously tested and qualified. We also did not find any compelling evidence that such testing has been conducted, since appropriately detailed records of test results are not documented and retained .

This item does not adequately reflect or conform either to recognized industry best practices, or to the practical operations experience of the consultants.

Reference Standards

ITU-T TELECOMMUNICATIONS MANAGEMENT NETWORK (TMN):

INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY (ITIL) V3:

INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY (ITIL) : V3, there are four interdependent process comprising IT Service Continuity Management:

1. Design Services for Continuity
2. ITSCM Support
3. ITSCM Training and Testing
4. ITSCM Review

ITSCM Training and Testing objective is "to make sure that all preventative measures and recovery mechanisms for the case of disaster events are subject to regular testing."

Practical Experience:

Effectiveness of the BC/DR plan is tested through scenario simulation at least once per year.

BC-DR PLANS

Survey Question ID: 1.1.8.F

If "yes" are results of each test compiled and documented for subsequent review?

Yes

Evaluation:

We find that the <NATIONAL FIBER NETWORK> 's complete BC-DR plan is not adequately exercised and tested on some regular, periodic basis, although we noted that various physical components of both the <UNIVERSITY NOC> and <WESTERN STATE AGENCY NOC> NOC, such as backup generators, are periodically subject to isolated functional testing.

Candidly, we were unable to determine confidently that comprehensive, complete plans ensuring Business Continuation and Disaster Recovery are available in <NATIONAL FIBER NETWORK> , and that they could be rigorously tested and qualified. We did not find any compelling evidence that such testing has been conducted, since appropriately detailed records of test results are not documented and retained.

This item does not adequately reflect or conform either to recognized industry best practices, or to the practical operations experience of the consultants.

Reference Standards

ITU-T TELECOMMUNICATIONS MANAGEMENT NETWORK (TMN):

INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY (ITIL) V3:

Recommendation specifies the objective of the ITSCM Review process as "to review if disaster prevention measures are still in line with risk perceptions from the business side, and to verify if continuity measures and procedures are regularly maintained and tested."

Practical Experience:

BC/DR testing results are reported to senior management following the annual exercise.

PERFORMANCE QA

Survey Question ID: 1.3.1.B

How are SLA's objectives considered in this process?

<NATIONAL FIBER NETWORK> does not have SLA's. Fiber cut SLA's are reviewed for the last 6 months. Hardware and remote hands targets are reviewed on a quarterly basis.

Evaluation:

We find that <NATIONAL FIBER NETWORK> currently does not offer Service Level Agreements to its existing base of customers. We strongly believe that with - or soon after - the introduction of commercial customers onto the <NATIONAL FIBER NETWORK> network, the <NATIONAL FIBER NETWORK'S NOC> services should be expected to propose, and perform according to, explicit terms and conditions that are embodied in "routine" Service Level Agreements. Furthermore, we expect that such SLA's will encompass minimum requirements for specific network data transport performance attributes such as throughput and latency, and probably others.

We expect that in order to support these service commitments, <NATIONAL FIBER NETWORK> must substantially broaden its capacity management capabilities and processes, and associated operations support system functions.

This item does not adequately reflect or conform either to recognized industry best practices, or to the practical operations experience of the consultants.

Reference Standards

ITU-T TELECOMMUNICATIONS MANAGEMENT NETWORK (TMN):

INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY (ITIL) V3:

Recommendation specifies a capacity management framework, comprised of

1. Business Capacity Management
2. Service Capacity Management
3. Component Capacity Management

The framework addresses strategy, organization, process, and technology employed in comprehensively managing capacity.

Practical Experience:

Yes

PROVISIONING

Survey Question ID: 1.5.1.A

Please briefly identify the department that has explicit responsibility for conducting all provisioning tasks in the network.

Engineering defines resources, the business office orders equipment, operations deploys and configures the resources.

Evaluation:

We find that while the change management process is a mature and proven process in the <NATIONAL FIBER NETWORK'S NOC>, the complement of required circuit provisioning functions in the <NATIONAL FIBER NETWORK> do not fully conform to ITIL recommendations or to our practical experience.

We have observed in carrier operations that Provisioning is typically organized with distinct department-level identity, and with explicit accountabilities for tasks that follow network engineering tasks and precede operations tasks. This scope of its accountabilities encompasses order entry, circuit provisioning, and test and turn up of new circuit facilities.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

NOTE: Although our initial survey did not explicitly pose any questions regarding physical implementation characteristics of the <NATIONAL FIBER NETWORK> 's network nodes, there was discussion on this point during the course of the NOC visit in Indianapolis on May 18. Based on that input, we find that the <NATIONAL FIBER NETWORK> 's practice of supporting a direct physical cable connection of a cross-connect cable from an interface cards of its optical node, without an intervening patch panel, and potentially leading directly to customer equipment interfaces does not conform to industry-recognized practices regarding structured cabling design. Although patch panel implementation is not mandated, well established commercial conventions recommend the use of these passive devices to enhance network interconnection convenience and flexibility, as well as to provide topological reference points for testing and diagnostic intervention.

With regard to this specific gap item, relevant guidelines for structured cabling can be found in the TIA standards document [TIA 569-B.1 Commercial Building Standards for Telecommunication Pathways and Spaces](#). Furthermore, accepted industry conventions for

network interconnection between a Service Provider and a Service Customer will be found in the [Interconnection Template, Issue 3.0 \(ATIS – 0300004\)](#) published by the Alliance for Telecommunications Industry Solutions (ATIS).

Reference Standards

ITU-T TMN:

ITIL V3:

Recommendation defines various roles that are likely to cross assorted functional organizations and several distinct processes within two or more core disciplines.

The provisioning scenario would likely engage:

1. Request Analyst, within the Request Fulfillment process
2. Change Manager, within the Change Management process
3. Asset Analyst, within the Asset Management process
4. Change Implementer, within the Change Management process, and
5. Change Manager once more, within the Change Management process.

Further process effects would be expected in the assortment of Capacity Management processes, and the various roles engaged there.

Practical Experience:

Provisioning department

Operational Deficits Summary

In this study, we also identified 26 “deficits” in various aspects of the <NATIONAL FIBER NETWORK’S NOC>’s operations, as assessed against either best practice concepts or our own practical experience.

We use the term “deficit” to convey that while we noted some degree of conformance to a norm, we also believe that a more complete alignment with a best practice will provide a specific and significant benefit to the operation overall.

Recommendations to Address Operational Deficits

Similar to the Gap Remediation Recommendations made above, we also offer some summary suggestions in addressing these operational deficits, and enumerate them in the following list.

Table 3 - Operational Deficits, below, summarizes our findings and recommendations.

Related to Survey Items	Operational Deficit Summary	Remediation Recommendations
Fault management		
1.1.1F	<NATIONAL FIBER NETWORK'S NOC> lacks an established focus on Applications Management, per recognized industry best practices	Pursue further inquiry as to whether the functional equivalent of the Application Management role is represented in the <NATIONAL FIBER NETWORK> organizational structure. If it is not effectively represented, reconsider the cost/benefit of adopting the ITIL model, specifically in support of <client name>'s operational requirements.
1.1.1O	Customer-driven designations of criticality and severity may conflict somewhat with <NATIONAL FIBER NETWORK'S NOC> current practices	Review the cost/benefit of fully adopting the ITIL V3 recommended model for severity designation, combining evaluations of impact
1.1.1R	Without SLA structures in the <NATIONAL FIBER NETWORK'S NOC>, unique escalation requirements of individual commercial customers will require some mechanism for specification and enforcement	Pursuant to the adoption of formal Service Level Agreements as a routine feature of most managed network service offerings, incorporate terms that address the specification of escalation criteria and performance.
1.1.1W	<NATIONAL FIBER NETWORK'S NOC> evidently lacks a unified, well-defined qualification process for new device types prior to production integration and deployment	Develop an explicit process for qualifying new device types for integration into the operations support system.
Ticket management		
1.1.2S	There is a subtle distinction between actual fault status update and the time-stamp that is attached to the requisite manual update of status in a ticket	Pursuant to the implementation of a bi-directional interface between Alertmon and Footprints, implement automatically time-stamped update entries in the related ticket for each instance of a change in fault status reported by a device
1.1.2V	SLA-based terms or service features are not standard practice of the <NATIONAL FIBER NETWORK'S NOC>	Review and consider the cost/benefit of fully adopting the ITIL V3 recommended model regarding Service Level Agreement terms that specify individual customer requirements for service performance.
1.1.2W	Routine procedure does not provide some of the recommended data items	Review and consider the cost/benefit of fully adopting the ITIL V3 recommended model, defined in the Incident Record and Problem Record checklists.
1.1.2Y	Customer self-administration for web portal access is an established norm	Review security practices and processes with regard to the NOC web portal access to the ticketing system, in view of accommodating the specific needs of commercial customers
Escalation Management		
1.1.4.B, 1.1.4.C	SLA-based terms or service features are not standard practice of the <NATIONAL FIBER NETWORK'S NOC>	Review and consider the cost/benefit of fully adopting the ITIL V3 recommended model regarding Service Level Agreement terms that specify individual customer requirements for service performance.
Vendor management		

1.1.5.B	SLA-based terms are not required by the <NATIONAL FIBER NETWORK> of its vendors.	Review and consider the risk/cost/benefit of adopting a policy of requiring new and existing vendors or suppliers to include SLA-based guarantees.
1.1.5.C	<NATIONAL FIBER NETWORK'S NOC> evidently does not support an explicit Supplier Management role	Designate a staff individual to fulfill the Supplier Manager role, as defined in the ITIL V3 recommended model.
Troubleshooting & Diagnostics		
1.1.6.E	<UNIVERSITY NOC> and <WESTERN STATE AGENCY NOC> use of CTC and CTM could be more consistent	Initiate a program of routinely cross training NOC technical staff and engineering staff for proficiency with both CTC and CTM.
1.1.6.G	Industry recognized technical certifications of NOC staff may be more significant with commercial customers	Initiate a program that incents NOC technical staff to pursue relevant, industry-recognized professional certifications.
1.1.6.H	Minimum annual technical staff training commitments are limited	Review and consider the cost/benefit of establishing a minimum of forty (40) hour per year per technical staff member for formal training on technical topics that are relevant to the objectives of the NOC organization.
Planned events		
1.1.7.A, 1.1.7.C	Planned network event management procedures do not appear to actively engage extensive customer input	1) Devise and adopt process revisions to insure the inclusion of customer input during the preparation phase of planned network events. 2) Consider expanding the scope and schedule of routine maintenance windows in which Planned Events will be executed, in alignment with typical commercial practices.
BC-DR Plans		
1.1.8.A	Test plans for verifying BC-DR Plans do not appear to be sufficiently detailed and routine, with detailed results recorded and reviewed.	1) In close collaboration with <client name>, as representative of commercial customer needs, devise and periodically (i.e. semi-annually) conduct a comprehensive test of the BC-DR plan. 2) Ensure the collection, recording, retention and internal management review of detailed results from such testing. 3) Initiate an audit and review by an external party on the occasion of the first test of the BC-DR plan.
Change management		
1.2.1.C, 1.2.1.H	Planned network event management procedures do not appear to actively engage extensive customer input	Devise and adopt process revisions to insure the inclusion of customer input during the preparation phase of planned network events.
1.2.1.J	No specific communication record is used to convey change orders, such as the "Installation Work Order" recommended in ITIL V3. Also, no explicit Release Manager role as defined per ITIL model.	Review the risk/cost/benefit of more fully adopting the ITIL V3 recommendation with respect to the explicit role of a Release Manager.
Configuration backups		
1.2.2.H, 1.2.2.I	Specific tests to verify management access of network devices which have been reconfigured are not routinely conducted in the closeout protocol	Devise and adopt process revisions to include application testing by the customer and network management reachability testing by the NOC following configuration changes.
Performance monitoring		

1.3.2.H	Routine periodic review and adjustments of select metrics threshold values to accommodate drift are not conducted.	1) Devise and adopt process revisions to review and adjust performance metric thresholds on a periodic basis, oriented to accomplishing two objectives: a) to identify any spans the are moving +/- from their original values b) to adjust the thresholds above and below the current value. 2) Augment the process by employing standard SNMP threshold crossing alarms.
Preventative security		
1.4.1.D, 1.4.1.K	Physical access to the <WESTERN STATE AGENCY NOC> NOC could be further secured with additional key card readers	Install additional ID card readers at both entry points in the <WESTERN STATE AGENCY NOC> NOC.
1.4.1.L	Pre-employment requirements of candidate staff are not as extensive as commercial customers may expect or require	Review the risk/cost/benefit of establishing a pre-employment screening policy that is consistent across both NOC facilities, and is consistent with typical large enterprise or carrier organizations.
1.4.1.Q	Authentication credentials are evidently not reviewed annually, a generally accepted practice	Review the cost/benefit of annually reviewing all authentication credentials, and initiate a policy change if warranted.
Provisioning		
1.5.1.A, 1.5.1.B	Despite the maturity of the Change Management process practiced by the <NATIONAL FIBER NETWORK'S NOC>, there is no organizational or system focus to comprehensively manage overall circuit provisioning activities.	1) Review and consider the risk/cost/benefit of adapting the NOC organization to include an explicit "Provisioning" function, presumably at a department level. 2) Pursuant to the adoption of Service Level Agreements for commercial customers, ensure that performance terms for provisioning services are included.
1.5.1.D	The dataset comprising the prescribed form is lacking adequate details specifying new circuit requests	1) Review and consider the cost/benefit of fully adopting the ITIL V3 recommended data model, defined in the Request for Change (RFC) and Change Record checklists. 2) Examine data models of established provisioning management systems, with the objective of identifying extensions to the current <NATIONAL FIBER NETWORK> data model for possible subsequent implementation.
1.5.1.F, 1.5.1.H	The current mode of operation utilizes the <NATIONAL FIBER NETWORK'S NOC> ticket management system to track the implementation project aspects of provisioning a new circuit, lacking the features and functions that could directly facilitate provisioning of new circuit facilities.	Investigate and evaluate alternative provisioning management systems that can support extensive integration with the existing ticketing management system (Footprints) as well as the underlying configuration management database (CMDB).
Management staffing		
1.6.2.F	There is no single point of accountability within the organization for devising and advocating a close alignment between <NATIONAL FIBER NETWORK'S NOC>'s service capabilities and offerings and its customer's explicit – and implicit – needs.	Review and consider the cost/benefit of fully adopting the ITIL V3 recommendation regarding the role of Service Portfolio Manager, who is responsible for driving strategic decision on current and future service offerings, under the direction of, and in collaboration with a strategic steering committee.

Table 3 - Operational Deficits

Operational Deficits Details

Individual deficits that we noted in <NATIONAL FIBER NETWORK'S NOC> practices or systems are detailed in the following section, on an item by item basis, and listed according to the same categorization employed in the survey.

Each item in the Gap Details section is formatted as follows:

- Survey Question ID: refers to the question's identification number assigned in the initial questionnaire distributed in March, 2009. The question is restated, followed immediately by the answer values (in italics). Wherever multiple choices were available in the questionnaire, all items that were checked in the <NATIONAL FIBER NETWORK> response are included here, while unchecked items are not listed.
- Evaluation: this segment contains our detailed assessment of the item response
- Reference Standards: as discussed at the beginning of this report, the established industry norms contained in the recommended ITU-T TMN model and the operating recommendations contained in ITIL Version 3, wherever applicable, are identified. Wherever either recommendation is silent on a particular point, the space under the title remains blank. The Practical Experience norm is derived from the first-hand experience of either or both of the contributing Augury consultants.

FAULT MANAGEMENT

Survey Question ID: 1.1.1.F

Please submit a graphic organizational chart that encompasses the NOC technical and managerial staff.

TBD

Evaluation:

<NATIONAL FIBER NETWORK> organizational structure clearly reflects a designated focus in three of the four "key" functional areas that are identified as best practices in the ITIL V3 Recommendation: Service Desk, Technical Management, and Operations Management. However, the focus on Application Management is not as evident.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

Not defined

ITIL V3:

Recommendation does not dictate an organizational requirement. It does identify four "key" functions in the Service Operations guideline: Service Desk, Technical Management, Application Management, and Operations Management.

Practical Experience:

FAULT MANAGEMENT

Survey Question ID: 1.1.1.O

According to what criteria is the severity of a particular event determined?

Per our own standard

Evaluation:

The severity of a particular event is defined based on two criteria:

1. Customers' assessment of the issue
2. Criticality of the event

It is clear that the <NATIONAL FIBER NETWORK> staff always manages to the greater of the two severities, which is defined in the ticketing system.

Commercial customers with critical application, especially between Data Centers, are likely to consider the loss of facility redundancy of "protected" circuits at the highest levels of criticality and severity.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

Not defined

ITIL V3:

Practical Experience:

Optical transport equipment manufacturer's recommendation (e.g. Nortel, Cisco, Lucent, etc.)

FAULT MANAGEMENT

Survey Question ID: 1.1.1.R

What criteria drive internal and external escalations of open or active problems? (Check all that apply)

Severity

Type of problem

Aging

Evaluation:

The <NATIONAL FIBER NETWORK> currently responds to events based on severity, criticality and aging, but not on Service Level Agreements. No contractual distinction exists today. The consultant anticipates that in order to satisfy commercial customer requirements, the <NATIONAL FIBER NETWORK> will be expected or required to make escalation distinctions based on terms specified in a Service Level Agreement (SLA), as well as on a categorical policy based on severity, criticality and aging.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

The Trouble Report status change notification...determines whether the service customer should be notified (according to the terms of the service customer's contract and rules provided by the Trouble report policy B-OSF). [Sec 6.6.3.2, ITUT Recomm M.3400]

ITIL V3:

Practical Experience:

- (1) Severity
- (2) Service Level Agreement commitments
- (3) Problem aging

FAULT MANAGEMENT

Survey Question ID: 1.1.1.W

Is there a documented process that applies to the OSS environment specifying how to integrate new types of network devices, as well as their accompanying catalog of specific event types, into the scope of the event management system?

Yes

Evaluation:

Although the availability to NOC staff of engineering laboratory facilities coupled with established processes for developing and maintaining Standard Operating Procedures for network operations reflects a substantial alignment with the notion of a reproducible process of qualifying new device types into the operations support system, we noted the lack of explicit information regarding this process.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITU-T M.3400 defines various categories of policy formulation as substrate to the provisioning, performance, and fault monitoring processes. [ref Appendix I.1 Customer Administration, ITU-T M.3400]

ITIL V3:

No explicit recommendation or requirement

Practical Experience:

Yes

TICKET MANAGEMENT

Survey Question ID: 1.1.2.S

Which ticket actions are time-stamped in your ticket management system? Check all that apply.

1. *Creation*
2. *Change in fault status*
3. *Journal Entry*
4. *Change in admin detail*
5. *Ticket resolved*
6. *Ticket closed*

Evaluation:

<NATIONAL FIBER NETWORK> complies with conventional standards to provide time stamped updates on each ticket. We noted that the change in fault status is a manual update and the time stamp of the update and the real time of the change in fault status are not the same.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

Practical Experience:

1. Creation
2. Change in fault status
3. Journal Entry
4. Change in admin detail
5. Ticket resolved
6. Ticket closed

TICKET MANAGEMENT

Survey Question ID: 1.1.2.V

For what types of events are customers proactively notified?

1. *Non-service affecting events*
2. *Service affecting events*
3. *Problem status changes*
4. *Emergency change procedures*
5. *Planned maintenance windows*

Evaluation:

We find that the <NATIONAL FIBER NETWORK'S NOC> complies with the TMN Standards for proactive notification to customers for the five types of events.

However, we also note that, since <NATIONAL FIBER NETWORK> does not offer Service Level Agreements, it does not conform to the best practice recommendations of ITIL V3, with respect to accommodating notification criteria and procedures specified in SLA terms. Based on our experience, we note some risk in this position. One of the possible consequence of this discrepancy would be an inability to systematically accommodate multiple, unique requirements from diverse customers.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be

considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

Standard specifies proactive notification for:

1. Service affecting events
2. Periodic updates throughout problem duration
3. Problem status changes
4. Emergency change procedures
5. Planned maintenance windows

ITIL V3:

Recommendation advocates specification of notification criteria and procedures within Service Level Agreements

Practical Experience:

TICKET MANAGEMENT

Survey Question ID: 1.1.2.W

When the customer is contacted what standard information is provided? Is the standard information provided the same across all delivery methods (Phone, Paging, E-mail, Text)?

1. *Case ID*
2. *Problem description*
3. *Time of occurrence*
4. *Provisional diagnosis*
5. *Action plan*

Evaluation:

We find that <NATIONAL FIBER NETWORK'S NOC> complies with many, but not all, of the components of the TMN Standard, as well as checklist elements proposed in the ITIL V3 best-practices recommendations.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be

considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

Standard specifies minimum record content:

- Case ID
- Problem description
- Time of occurrence
- Provisional diagnosis
- Action plan
- Estimated time to action

ITIL V3:

Recommendation defines an Incident Record contents. The IR includes: unique id, date & time, SD agent, notification method, user data, callback method, symptoms, affected users/areas, priority (combination of urgency and severity), and product category

Practical Experience:

TICKET MANAGEMENT

Survey Question ID: 1.1.2.Y

Who administers accounts for the customer portal?

NOC

Evaluation:

Customer self-administration of portal based services is an established norm.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

Recommendation defines the Access Management subprocess under the Service Operations process. In turn, its constituent subprocesses encompass "Maintaining Catalogue of User Roles and Access Policies" and "Manage User Access Requests".

Practical Experience:

ESCALATION MANAGEMENT

Survey Question ID: 1.1.4.B

Are customer-specific, or unique, escalation policies documented and accessible to the NOC staff technicians and managers?

Yes

Evaluation:

We find that <NATIONAL FIBER NETWORK'S NOC> conforms substantially to ITIL recommendations, since it observes a standard escalation process that is applied across all customers. However, we believe that with the introduction of commercial customer, the escalation process will need to accommodate different SLA terms or requirements (also recommended in ITIL V3), in contrast with the current process in which all unscheduled and scheduled events are handled in the same manner.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

No explicit requirement

ITIL V3:

Recommendation defines escalation triggers based on rule sets, but does not specifically link such rulesets to individual customer's requirements.

Practical Experience:

Yes

ESCALATION MANAGEMENT

Survey Question ID: 1.1.4.C

Briefly describe the types of authorized escalations

Aging related, based on the severity of the issue, and customer requested, which are always honored.

Evaluation:

We find that, while <NATIONAL FIBER NETWORK'S NOC> conforms to ITIL recommendations, it does not conform to our practical experience, which accommodates customer-specific requirement specified in the terms of SLAs. Escalations are based on criticality and severity, and elapsed time.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

No explicit requirement

ITIL V3:

Recommendation escalation criteria generally based on priority (combination of urgency and impact) and elapsed time

Practical Experience:

SLA specified process

VENDOR MANAGEMENT

Survey Question ID: 1.1.5.B

Which categories do one or more vendors to the NOC offer documented Service Level Agreements?

- 1. Fiber providers*
- 2. Data network carriers*
- 3. Hardware suppliers*

Evaluation:

The conventional practice is that all suppliers/vendors that supply services to a Carrier/Large enterprise network must offer a SLA that guarantees a level of performance, which if not met will result in a penalty. The two major providers have response time commitment, but no guarantees. This will be an issue for large commercial customers who expect a SLA's with penalties.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

Practical Experience:

1. Fiber providers
2. Data network carriers
3. Field service provider
4. Network HW/SW provider

VENDOR MANAGEMENT

Survey Question ID: 1.1.5.C

Is there a documented process for evaluating and monitoring vendors or suppliers?

Yes

Evaluation:

We find that <NATIONAL FIBER NETWORK'S NOC> conforms to both ITIL recommendations and practical experience of Supplier (or Vendor) Management. Although the ITIL role of Supplier Manager is exemplified in certain aspects through the Engineering and Operations Management staff, there is no individual point of accountability for continuously ensuring supplier effectiveness and value.

<NATIONAL FIBER NETWORK> operations management also conduct quarterly reviews in which aspects of Vendor Management are reviewed. Changes in incumbent vendors are based on cost, quality of service delivery and an opportunity to utilize a new vendor, such as in new network build outs, or node replacements.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

Recommendation defines Supplier Management Process as a process within the Service Design core process, and encompassing the supplier evaluation sub-process.

A Supplier Manager role is also explicitly defined in the same core process.

Practical Experience:

Yes, specified in a New Equipment Qualification process

TROUBLESHOOTING & DIAGNOSTICS

Survey Question ID: 1.1.6.E

Are there manufacturer-specific element (or device) management systems installed and available to the NOC technical staff to use in troubleshooting problems in the network?

Yes

Evaluation:

We find that <NATIONAL FIBER NETWORK'S NOC> conforms substantially to practical experience in the use of manufacturer specific element managers: Cisco Transport Controller (CTC) and Cisco Transport Manager (CTM). However, we note that the two NOC's (<UNIVERSITY NOC> and <WESTERN STATE AGENCY NOC>) do not employ these two products to the same extent. <UNIVERSITY NOC> relies more on CTC, while <WESTERN STATE AGENCY NOC> relies more on CTM. Since these too, but not identical functionality, each tool demonstrating unique strengths and weaknesses. In light of this, we advocate more consistent use of both tools between the NOC facilities.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

No explicit requirements

Practical Experience:

Device-specific element management systems are generally from the device manufacturers.

TROUBLESHOOTING & DIAGNOSTICS

Survey Question ID: 1.1.6.G

Are NOC staff technicians required to participate in a continuing plan of technical training sessions or self-paced tutorials?

Yes

Evaluation:

We find that <NATIONAL FIBER NETWORK'S NOC> conforms to our practical experience of managing the ongoing training of existing technical staff. However, as the commercial use of the network increases, we expect that industry-recognized staff certifications will become increasingly significant to both operational and marketing success.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

No explicit requirements

Practical Experience:

Yes

Qualified self-paced tutorials are as acceptable as classroom-based training sessions.

Mutual staff training sessions also supported, delivered by senior technical staff.

TROUBLESHOOTING & DIAGNOSTICS

Survey Question ID: 1.1.6.H

On an annual basis, how much incremental training is the NOC staff technician typically expected to complete?

16 to 40 hours

Evaluation:

We find that <NATIONAL FIBER NETWORK'S NOC> lack of a minimum expectation of 40 hours per year of training for technical staff is inadequate.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

No explicit requirements

Practical Experience:

Up to 40 hours annually

PLANNED EVENTS

Survey Question ID: 1.1.7.A

Briefly summarize how a planned network maintenance activity is scheduled.

Technical staff develop a plan and scope of work and then send a notification to the NOC to schedule & announce the work in the requested time frame.

Evaluation:

We find that <NATIONAL FIBER NETWORK'S NOC> minimally conforms to best practice recommendations, as well as to our practical experience. We expect that commercial customers will be more sensitive to the planned event scheduling than has been the case in the past. Business-related events, such as closeouts at the End-of-Month, End-of-Quarter, and End-of-Year, as well as scheduled quiet periods, will influence the customer acceptance of planned event schedules. We believe, that scheduling planned events in the presence of the large enterprise or carrier environment will require additional coordination between customers and the <NATIONAL FIBER NETWORK'S NOC>.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards**ITU-T TMN:****ITIL V3:**

Recommendation added "Change Management Process" to the Service Transition process area, and simultaneously advocated the creation of distinct "request for change" (RFC) handling, distinguished from other incident-oriented events.

The deployment of planned changes is encompasses in the processes "Release and Deployment Management", "Service Validation and Testing", and "Service Asset and Configuration Management"

Practical Experience:

Requests for planned maintenance are scheduled into standing daily maintenance windows. Window times may vary between weekday and weekend periods.

PLANNED EVENTS

Survey Question ID: 1.1.7.C

How far in advance is a customer typically notified of a planned, non-emergency network maintenance event?

2 to 5 business days

Evaluation:

We find that <NATIONAL FIBER NETWORK'S NOC> minimally conforms to best practice recommendations, as well as to our practical experience. We expect that commercial customers will be more sensitive to the planned event scheduling than has been the case in the past. Business-related

events, such as closeouts at the End-of-Month, End-of-Quarter, and End-of-Year, as well as scheduled quiet periods, will influence the customer acceptance of planned event schedules. We believe, that scheduling planned events in the presence of the large enterprise or carrier environment will require additional coordination between customers and the <NATIONAL FIBER NETWORK'S NOC>.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

NOTE (10 August 2009): Subsequent to receiving information regarding this question, <NATIONAL FIBER NETWORK'S NOC> instituted a policy change in this regard, committing to providing 7 days notification prior to a pending network maintenance event. This change in terms was done in direct consideration of a request made by <client name> on behalf of a <client name> customer.

Reference Standards

ITU-T TMN:

ITIL V3:

Not explicitly specified

Practical Experience:

Based on impact to the customer as determined by the customer.

BC-DR PLANS

Survey Question ID: 1.1.8.A

Does the NOC maintain a documented specification of the NOC's Business Continuity and Resumption Process (BCRP)?

Yes

Evaluation:

We find that the <NATIONAL FIBER NETWORK'S NOC> does not fully conform to ITIL recommendations for Business Continuation/Disaster Recovery planning and testing.

We note that <UNIVERSITY NOC> and <WESTERN STATE AGENCY NOC> may be able to operate somewhat independently in the event of a catastrophic failure in one of the two NOC locations, and we understand that both centers have their respective backup centers, in Bloomington and Irvine.

However, we did not find that <NATIONAL FIBER NETWORK'S NOC>'s BC-DR plans represent a single integrated plan that would be likely to stand up to commercial

scrutiny⁵.

We note that the BC-DR plan of record does not include an explicit test plan, nor does it define a method for reviewing, and possibly improving the plan on a periodic basis. We advocate a more extensively integrated plan along with an explicit test plan in order to assure that in the event of a disastrous event, adequate recovery of network management services can be expected.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

Recommendation specifies the "IT Service Continuity Management" (ITSCM) as a distinct process with Service Design core discipline. As such there is a requirement for its comprehensive documentation as part of the Service Delivery Knowledge Base.

Additional related documents specified under the ITSCM heading include:

1. ITSCM Testing Schedule
2. Business Continuity Strategy
3. Disaster Invocation Guideline
4. Index of Disaster Relevant Information
5. IT Service Continuity Report
6. IT Service Continuity Strategy
7. Recovery Plan
8. Test Protocol

Practical Experience:

Yes

Business Continuity / Disaster Recovery plan is documented and maintained in an online repository accessible to all members of technical and managerial staff.

⁵ The Business Continuity Institute (UK) has published extensively practical guidelines on developing, testing, maintaining and auditing an effective business continuity strategy. For further discussion regarding auditing guidelines see <http://www.thebci.org/gpg/GPG2008-2Section5FINAL.pdf>.

Content of the plan is reviewed annually by management to ensure applicability and completeness.

CHANGE MANAGEMENT

Survey Question ID: 1.2.1.C

If so, which departments or roles are the typical stakeholders in the review and authorization process?

Engineering, Operations and the CEO.

Evaluation:

We find that <NATIONAL FIBER NETWORK'S NOC> conforms to ITIL recommendations as well as our practical experience. However, we note that end-user customer involvement in the Change Management process is not defined or required. We expect that commercial customers will want to be involved in providing input and approvals in the Change Management process.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

Recommendation defines a "Change Authorization Hierarchy" specifying who is to authorize a change, depending on the change's associated "level of risk".

Furthermore, V3 specifies two related sub-processes: "Assessment of Urgent RFC by ECAB" and "Change Assessment by CAB", both of which describe the stakeholder categories associated with changes based on risk and impact.

Practical Experience:

Standing board consisting of

1. executive sponsor
2. mid-level manager with budget responsibility for NOC operations
3. management representative from Finance, Customer Service, and Sales
4. at least 2 seasoned engineers, depending on the proposed deployment (network, operations support software, business support

software)

CHANGE MANAGEMENT

Survey Question ID: 1.2.1.H

How are changes categorized, by severity, by size/scope, or other factors?

1. *Impact*
2. *Scope*
3. *Severity*
4. *User requirement*

Evaluation:

We find that <NATIONAL FIBER NETWORK'S NOC> conforms to ITIL and practical experience, in evaluating Requests for Changes based on impact, scope, severity and user requirement. We also note, however, that customers are not identified as stakeholders in the process.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

Requests for Change (RFC) are evaluated on the basis of

1. scope
2. impact
3. risk

Practical Experience:

1. Impact
2. Scope
3. Severity

4. User requirement

CHANGE MANAGEMENT

Survey Question ID: 1.2.1.J

Briefly summarize how authorizations for proposed configuration changes are recorded and communicated to stakeholders.

Through e-mail, meetings, and conference calls.

Evaluation:

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

Both V3 and V2 recommend communication of authorized changes via "Installation Work Order", which is a record that is created, conveyed, and managed by the Release Management role.

Release Manager is responsible for planning, scheduling, and controlling the movement of releases to test and live environments.

Practical Experience:

Automated workflow system ensures notifications to specified approval lists (i.e. board members) regarding pending change proposals are posted, tracks reviews and indicated approvals, and issues summary notification when required approvals are submitted.

CONFIGURATION BACKUPS

Survey Question ID: 1.2.2.H

What test routines are performed following configuration changes to assure that user needs are satisfied and that the affected device remains managed?.

Management capability is immediately obvious in the networking domain.

Evaluation:

We find that <NATIONAL FIBER NETWORK’S NOC> does not fully conforms to our practical experience, with respect to requiring specific user tests and management Reachability tests to be conducted following any configuration change to a network device. We believe that NOC users must validate that most changes in configurations have not adversely affected existing application connectivity or new features that prompted the need for the change. Further, we believe that management reachability must also be tested to eliminate the prospect that it affected by a configuration revision.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

No explicit recommendation

Practical Experience:

1. Management integrity is confirmed through basic reachability testing conducted immediately following a configuration revision
2. Configuration changes related to specific user requirements are tested as required by the customer

CONFIGURATION BACKUPS

Survey Question ID: 1.2.2.I

Are device configuration changes always tested before a device is returned to production-ready status and operation?

No

Evaluation:

We find that <NATIONAL FIBER NETWORK’S NOC> does not fully conforms to our practical experience, with respect to requiring specific user tests and management reachability tests to be conducted following any configuration change to a network device. We believe that NOC users must validate that most changes in configurations have not adversely affected existing application connectivity or new features that prompted the need for the change. Further, we believe that management reachability must also be tested to eliminate the prospect that it affected by a configuration revision.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

No explicit recommendation

Practical Experience:

Yes

PERFORMANCE MONITORING

Survey Question ID: 1.3.2.H

Are performance metric threshold values routinely adjusted to account for drift?

No

Evaluation:

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

The practical consequence of long-term drifting of certain tuned characteristics of an optical network, which are typically monitored for threshold crossing alerts, is the gradual loss of effectiveness of “acceptable” threshold settings. High and low threshold values are designed to account for performance variances within specification, and presume acute changes will occur, and be detected, based on likely changes in the measured parameter. To optimize this flexibility, routinely examining and adjusting threshold values ensures optimum measurement flexibility and accuracy in detecting threshold crossing alerts.

Reference Standards

ITU-T TMN:

ITIL V3:

Recommendation is not explicit

Practical Experience:

Yes

1. Manual adjustment based on conservative threshold settings alarming before specification limits are reached
2. Automatic adjustment via sliding averaging window and threshold exception sensitivity

PREVENTATIVE SECURITY

Survey Question ID: 1.4.1.D

Are the NOC's physical facilities secured against unauthorized access?

Yes

Evaluation:

We find that access to the <WESTERN STATE AGENCY NOC> NOC may present an opportunity for an added level of security. There are two access points into the <WESTERN STATE AGENCY NOC> NOC suite, but only one of them (an exterior door to the hall that is used for "egress only") is equipped with security badge scanner. The other door to the NOC is interior to the <WESTERN STATE AGENCY NOC>'s office suite, but relies on personal attention to ensure that the door is latched and locked. The main entrance to the office suite is equipped with a badge reader, with an automatic closer, latch and lock.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

Recommendation defines the role of IT Security Manager as being concerned with building/facilities access.

Practical Experience:

Yes

PREVENTATIVE SECURITY

Survey Question ID: 1.4.1.K

Is access controlled into the building that houses the NOC?

Yes

Evaluation:

There are two access points into the <WESTERN STATE AGENCY NOC> NOC suite, but only one of them is equipped with security badge scanner. The other door is considered for “egress only”, but relies on personal attention to ensure that the door is latched and locked.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

See entry for item 1.4.1.E

Practical Experience:

Yes

PREVENTATIVE SECURITY

Survey Question ID: 1.4.1.L

Are there pre-employment requirements of employee candidates that are intended to mitigate risk to customers of detrimental employee actions?

No

Evaluation:

We find that pre-employment standards at both <NATIONAL FIBER NETWORK’S NOC> facilities are inconsistent with our practical experience, as compared to norms in the telecommunications industry.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

Recommendation indicates that particulars are specified in local Security Policies

Practical Experience:

Yes

PREVENTATIVE SECURITY

Survey Question ID: 1.4.1.Q

How often are customer security authentications reviewed?

N/A

Evaluation:

We believe that customer authentications should be reviewed on a periodic basis, typically annually, in order to reduce the possibility of unauthorized users attempting to request services.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

Recommendation indicates that particulars are specified in local Security Policies

Practical Experience:

Annually

PROVISIONING

Survey Question ID: 1.5.1.A

Please briefly identify the department that has explicit responsibility for conducting all provisioning tasks in the network.

Engineering defines resources, the business office orders equipment, operations deploys and configures the resources.

Evaluation:

We find that while the change management process is a mature and proven process in the <NATIONAL FIBER NETWORK'S NOC>, the complement of required circuit provisioning functions in the <NATIONAL FIBER NETWORK> do not fully conform to ITIL recommendations or to our practical experience.

We have observed in carrier operations that Provisioning is typically organized with distinct department-level identity, and with explicit accountabilities for tasks that follow network engineering tasks and precede operations tasks. This scope of its accountabilities encompasses order entry, circuit provisioning, and test and turn up of new circuit facilities.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards**ITU-T TMN:****ITIL V3:**

Recommendation defines various roles that are likely to cross assorted functional organizations and several distinct processes within two or more core disciplines.

The provisioning scenario would likely engage:

1. Request Analyst, within the Request Fulfillment process
2. Change Manager, within the Change Management process
3. Asset Analyst, within the Asset Management process
4. Change Implementer, within the Change Management process, and
5. Change Manager once more, within the Change Management process.

Further process effects would be expected in the assortment of Capacity Management processes, and the various roles engaged there.

Practical Experience:

Provisioning department

PROVISIONING

Survey Question ID: 1.5.1.B

Does that department report as part of <NATIONAL FIBER NETWORK> Engineering management chain or <NATIONAL FIBER NETWORK> Operations management chain? Please briefly describe.

Both. Engineering defines resources, operations deploys and configures the resources.

Evaluation:

We find that while the change management process is a mature and proven process in the <NATIONAL FIBER NETWORK'S NOC>, the complement of required circuit provisioning functions in the <NATIONAL FIBER NETWORK> do not fully conform to ITIL recommendations or to our practical experience.

We have observed in carrier operations that Provisioning is typically organized with distinct department-level identity, and with explicit accountabilities for tasks that follow network engineering tasks and precede operations tasks. This scope of its accountabilities encompasses order entry, circuit provisioning, and test and turn up of new circuit facilities.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

See entry for item 1.5.1.A above

Practical Experience:

Organizationally, Provisioning Department is part of Customer Services, but is distinct from Network Operations Center. There is extensive interaction between those departments.

PROVISIONING

Survey Question ID: 1.5.1.D

Are new provisioning requests documented according to a standard form?

Yes

Evaluation:

We find that the prescribed form does not adequately specify a new circuit order or request.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

The Change Request checklist specifies requisite data elements

Practical Experience:

Yes

PROVISIONING

Survey Question ID: 1.5.1.F

Is there an online provisioning management system for recording and tracking all authorized provisioning requests?

Numera Footprints

Evaluation:

We find that the current mode of operation utilizes the <NATIONAL FIBER NETWORK'S NOC> ticket management system to track the implementation project aspects of provisioning a new circuit, and consequently lacks the features and functions that could directly facilitate provisioning of new circuit facilities.

The output of this process is then stored in the CMDB.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

The recommendation defines the data elements of the Request For Change (RFC)

Practical Experience:

Yes

PROVISIONING

Survey Question ID: 1.5.1.H

Does the online provisioning management system initiate notifications and alerts based on the status of a particular provisioning request?

Yes

Evaluation:

We find that the current ticketing application is not capable of initiating standard notifications on circuits in the provisioning process, such as order receipt, order acceptance, circuit due date, circuit FOC, test and turn up, circuit completion and more.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

No explicit recommendation

Practical Experience:

Yes

MANAGEMENT STAFFING

Survey Question ID: 1.6.2.F

Do all levels of management responsible for NOC operations participate in some fashion in long term and strategic planning activities?

Yes

Evaluation:

No single individual was identified with explicit accountability within the <NATIONAL FIBER NETWORK'S NOC> organization for devising, advocating and guiding a close alignment between <NATIONAL FIBER NETWORK'S NOC>'s service capabilities and offerings and its customer's explicit – and implicit – needs.

This item partially conforms to accepted industry best practices or to the practical experience of the consultant, and should be considered for possible revision or modification to some extent.

Reference Standards

ITU-T TMN:

ITIL V3:

Recommendation defines the role of "Service Portfolio Manager" as one who "decides on a strategy to service customers in cooperation with the Steering Group...[and] develops the service provider's offerings and capabilities".

The Steering Group may include any member of senior management from the business or from IT.

Practical Experience:

Yes