# Automated Recall Notification System Audit

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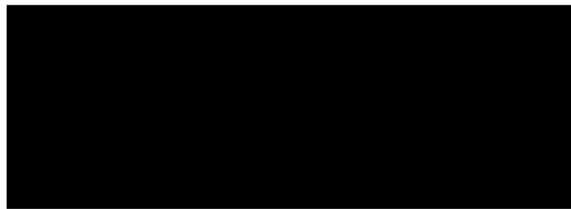
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## INTRODUCTION

The Automated Notification Response System (ANRS) operations audit of the █
████████████████████ was performed on request of █████ Corporation 14 July
2009.  The intent of this audit is to identify the current operational state of the
ANRS system, the DCC conference bridge, and the Audiolog MAX-PRO
recording server.

## EXECUTIVE SUMMARY

The audit of the █████ DCC NXT, Conference Bridge, and Audiolog MAX-PRO
recording server are all operating with reasonable to excellent performance and
moderate to low risks.  The issues effecting operational performance and
influencing operational risks are physical environment and telephony based.

The report provides a section for each area of audit DCC NXT, DCC conference
bridge, Audiolog MAX-PRO recording server, telephony, and physical
environment.  Telephony and physical environment were added to the audit as
they were the main contributors to operation performance degradation and
operation risks.

# DCC NXT Transition / Operation

The transition appears to have gone fairly smooth with minimal operational interruption. There are currently 15 to twenty scenarios with two new scenarios recently added. One scenario is run daily every shift and one scenario is run weekly. The remainders of the scenarios are run during an actual event.

Operators are actively engaged with the system during every shift.

The system is running smoothly although the customer is running with single threaded systems administrative support. The customer has extensive experience with the DCC 9.3 system and has had hands-on training for the NXT platform. However, the customer has not been able to take advantage of the formal classroom training.

The main issues are:
1. There is no testing of the emergency scenarios.
2. There is no testing to exercise all of the line attached to the NXT to assure that they are all working.
3. The remote access account for support locks up.
4. The proper way to exit NXT is to logout not use the "close window X button". Improper closure of the window, using the "X" button, results in account lock out. However, the "X" button is available. This creates confusion for the staff whose daily operational activities require that they interoperate with a wide variety of applications some of which the use the "X" button to exit and some of which the logout to exit. (*NOTE:* ▮▮▮ *has already logged this Bug-Fix and is tracking the resolution.)*
5. When the account timeout occurs it appears that the account is not properly closed via the automated system, resulting in the potential for account lock put.
6. The customer is relying on the hands on training provided and has not been able to take advantage of the available classroom training from DCC.

## Summary

Outside of the telephony issues previously identified it appears the two main categories of problems are account lock out and training.

Operational Performance:  7
Operational Risks:        4

The operation performance scale is from 0 to 10 where 0 is inoperative and 10 represents excellent uptime performance. The operational performance factor for the DCC 9.2 transition to NXT is set at seven for the following reasons:
1. The customer has created a mitigation strategy through the creation of multiple accounts. This helps to prevent total account lockout.

2. The will be some operational disruption as the user will have to "bounce" between accounts to discover which one is not locked.

The operational risks scale is from 0 to 10 where 0 is no risk and 10 is 100 percent risk to operations. The operational risks factor for the DCC 9.3 transition to NXT is set at seven for the following reasons:
1. There is the probability of an account lock out that will prevent remote support access or significantly interrupt local account access. This has been minimized through the action of the customer of creation of multiple backup accounts.

**Recommendations**

There should be a process to test each scenario on a routine basis to assure the viability and appropriateness of the scenario. Testing provides following benefits for the customer:
1. Scenarios are kept up-to-date.
2. Users are aware of the potential for the scenario and are kept informally trained to respond to the system through the interaction.
3. The systems administration team is kept informally trained on the system through the interaction.
4. There is a constant reminder to the senior leadership that there is a system for notification and recall in place and that it is viable.

A "Bug-Fix" should be logged with DCC to grey out the X button so that there is only a single option to exit an account. This will reduce operator confusion and prevent this cause of account lock out. NOTE: ▬▬ has already logged this Bug-Fix and is tracking the resolution.

A "Bug-Fix" should be logged with DCC to resolve the account timeout issue to assure that the automated account closure properly closes the account to prevent lockout. NOTE: ▬▬ has already logged this Bug-Fix and is tracking the resolution.

The customer needs to set a date for training in Nashville.

# DCC BULLETIN BOARD
The DCC bulletin board is part of the DCC NXT ANRS. It is reviewed separately to provide the view of its operations and risks without influence from the DCC NXT ANRS.

The customer expressed that the bulletin board has fallen by the wayside over time. The issue appears to be visibility and awareness. There appears to be no

program in place to publicize the existence or functionality of the bulletin board. The customer is considering shutting it down.

**Summary**

Lack of awareness, training, and visibility have resulted in the bulletin board being largely underutilized.

Operational Performance:  8
Operational Risks:          1

The operation performance scale is from 0 to 10 where 0 is inoperative and 10 represents excellent uptime performance. The operational performance factor for the Bulletin Board is set at eight for the following reasons:
1. There are no complaints or issues with the operational performance of the bulletin board.
2. The issues stem from lack of awareness, training, and visibility

The operational risks scale is from 0 to 10 where 0 is no risk and 10 is 100 percent risk to operations.  The operational risks factor for the Bulletin Board is set at one for the following reasons:
1. There is no operational risk associated with the bulletin board.  This function/feature is one of convenience and appears to have little or no impact on the customer's mission.

**Recommendations**

A "Bug-Fix" should be logged with DCC to grey out the X button so that there is only a single option to exit an account.  This will reduce operator confusion and prevent this cause of account lock out.

A "Bug-Fix" should be logged with DCC to resolve the account timeout issue to assure that the automated account closure properly closes the account to prevent lockout.

The customer needs to set a date for training in Nashville.

# AUDIOLOG MAX-PRO RECORDING SERVER AND CONSORTIUM II CONFERENCE BRIDGE

Although the audio conference bridge has not been put into a production service the recording system is filling DVD's with noise within a day or two.  This creates a significant issue for the customer in that if the recording system fills up a DVD and the conference bridge is live how does the customer assure adequate space on the DVD for the actual conference activity if there is spurious line noise?  The customer does not have the testing equipment to test the circuit to see what potential problems may exist.  While activating audio log files and reviewing the

DVD's may help identify potential circuit issues the probability of determining core cause from this troubleshooting modality is marginal at best.

There is a problem with installing the audio log software on the operator systems. The problem appears to be related to a network permissions issue but the actual core cause is not clear. The work around is for the operators to walk into the server room to gain access to this feature.

**Summary**

The issue of the recording system filling the DVD's with spurious noise even when there is no conference, which appears to be line noise on the circuit which is activating the recording system, represents a significant risk to the recording of desired conference bridge activity. A lack of test equipment and time prevent the customer from a self diagnosis of the problem. Verizon has not been able to identify the problem.

The problem with the inability to install and run the audio log software on the operator's workstations appears to be somewhat inconsequential to the customer.

Operational Performance: 3
Operational Risks:        8

The operation performance scale is from 0 to 10 where 0 is inoperative and 10 represents excellent uptime performance. The operational performance factor for the Audio Conference Bridge is set at three for the following reasons:
1. Noise filling the log files creates inherent risk that there may not be enough room in the log files to record an actual conference resulting in loss of critical information, or significant disruption to the conference to replace the full media.
2. It is indeterminate as to if the reboot of the system is clearing some form of system problem (i.e. line card synchronization etc.) or a "transmissions" problem (i.e. mux, line card, etc.)

The operational risks scale is from 0 to 10 where 0 is no risk and 10 is 100 percent risk to operations. The operational risks factor for the Audio Conference Bridge portion of the NXT installation and operation is set to 8 for the following reason:
1. There is a high probability that the noise on the line filling the log files will result in an emergency conference bridge action to not be fully recorded, possibly not recorded at all.

**Recommendations**

There needs to be a coordinated resolution effort with Verizon and Verint to identify the core cause of the issue and to enact a resolution.

The inability to install the software on the operators systems should be reviewed and resolved.

# TELEPHONY

On installation of the new NXT system there were two issues related to the T1 circuit. The first issue was that the system was unable to place outbound calls. Verizon performed troubleshooting and blamed the DCC NXT. DCC performed troubleshooting and blamed Verizon. Three reboots of the NXT server cleared the problem. The core cause of the issue was never identified. The second issue was a reoccurrence of inability to place outbound calls. The same results were encountered. The customer, again placed in the middle, resolved the problem with two reboots of the NXT system. Again, the core cause was not identified.

## Summary

The telephony issues related to the installation of the NXT system identify two main issues. The first issue is the inability to coordinate problem resolution with Verizon and Dialogic. This issue results in the customer being put in the center of the exchange with no leverage to escalate an issue to resolution. The second issue is the inability to identify core cause of the issues. This issue leaves the customer with the inability to achieve a final effective resolution to the problem.

Operational Performance: 3
Operational Risks:        8

The operation performance scale is from 0 to 10 where 0 is inoperative and 10 represents excellent uptime performance. The operational performance factor for the Telephony portion of the NXT installation and operation is set at three for the following reasons:
1. Reboot of the system takes valuable systems management time interrupting the existing priority efforts.
2. It is indeterminate as to if the reboot of the system is clearing some form of system problem (i.e. line card synchronization etc.) or a "transmissions" problem (i.e. mux, line card, etc.)

The operational risks scale is from 0 to 10 where 0 is no risk and 10 is 100 percent risk to operations. The operational risks factor for the Telephony portion of the NXT installation and operation is set to 9 for the following reasons:
1. Any unknown core cause of an error condition creates a margin of risk to operations. As the core cause is unknown it is unpredictable. However, the issue appears, at this time, to have a long period between failures and there appears to be a intermediate preventative solution.
2. The telephony issues are a direct impact to the operational performance and risk to the Audiolog MAX-PRO recording server.

## Recommendation

There needs to be a capability to log the issue and record the salient event markers to determine the cause of the outage, what is happening during a server

reboot, and what the chain of events are that lead to the reestablishment of service.  There also needs to be a coordinated resolution effort with Verizon and DCC.  These two combined efforts will aide in identification of a core cause and potentially identify a resolution.

# PHYSICAL ENVIRONMENT

The physical environment at ████████████ presents two main challenges.

The first challenge is the racking infrastructure. The racking infrastructure is telephony racks which are inadequate for use as systems racks due to the lack of depth. The lack of depth in the racks creates cable management issues which present operational and maintenance risks to the systems.

Photo 1 is an example of the lack of cable management. The cabling bundles at the back of the system clearly are difficult to manage and restrict airflow to/from the system.



**Photo 1**

Photo 2 is another example of the lack of cable management. The cabling will be difficult to manage and restrict airflow to/from the systems. This photo also highlights the difficulty in tracing or identifying cables.
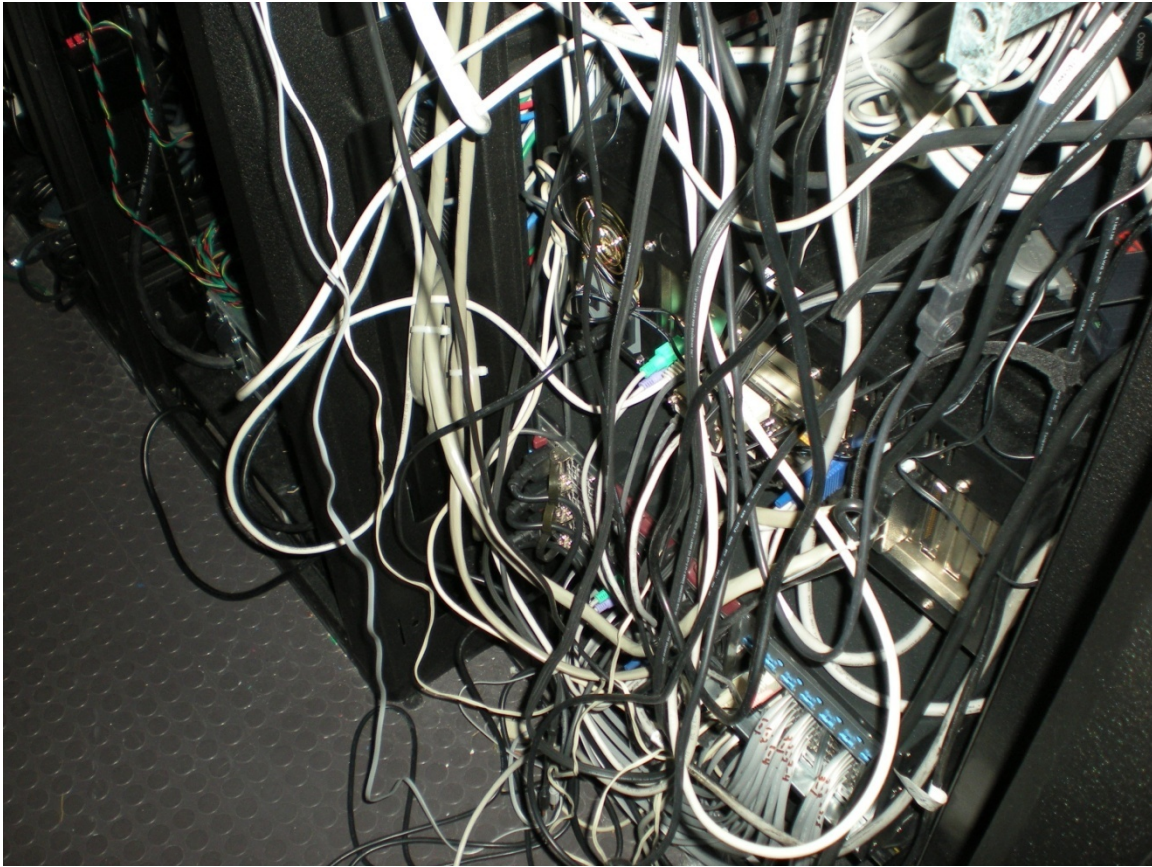
**Photo 2**

Photo 3 is a final example of the lack of cable management.  The cabling will be difficult to manage and restrict airflow to/from the systems.  A telco block (RJ11 or RJ45) can be seen to the left just under the rack glide.  This represents risk to the communications link.  Also this photo highlights the air restriction for the fans on the left side of the chassis.  Finally this photo highlights the difficulty in tracing or identifying cables.
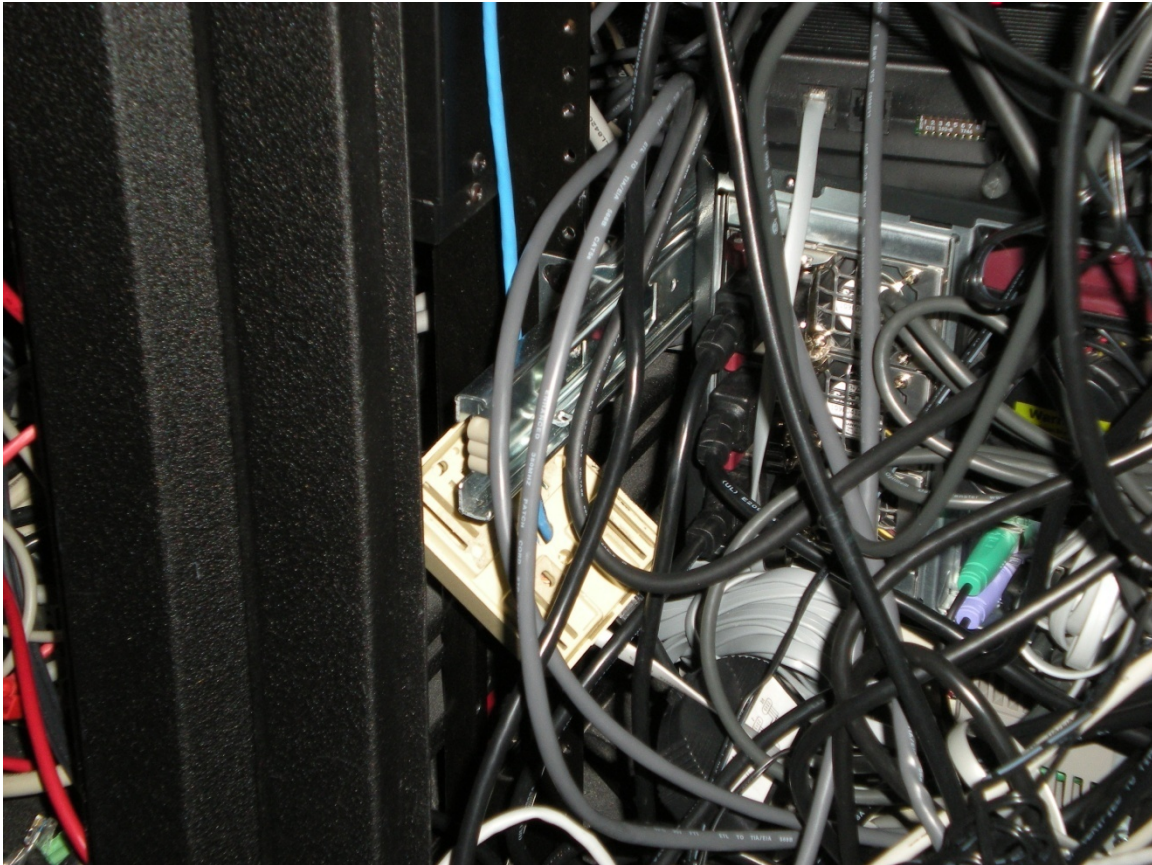
**Photo 3**

The second environmental challenge is power.  It is apparent that the building power infrastructure has some significant issues.  This problem is compounded with the local power grid issues.  Regular brown and blackouts result in routine systems outages and localized small UPS failures.

## Summary

The racking does not accommodate standard cable management solutions resulting in operational and maintenance risks.  Building power infrastructure problems are exasperated by power grid issues.

Operational Performance:  5
Operational Risks:            7

The operation performance scale is from 0 to 10 where 0 is inoperative and 10 represents excellent uptime performance. The operational performance factor for the Physical Environment portion is set at five for the following reasons:
1.  The lack of cable management presents marginal operational and maintenance risks.
2.  The power issues are severe enough to cause small UPS's to fail during blackouts.  This results in localized systems outages which have the

strong potential to result in file systems corruption and accelerated hardware failure.

3. The operators appear to be extremely familiar with the failure and recover procedures.  This minimizes the downtime.

The operational risks scale is from 0 to 10 where 0 is no risk and 10 is 100 percent risk to operations. The operational risks factor for the Physical Environment  is set to seven for the following reason:

1. Power outages severe enough to cause failure of the localized UPS's results in unplanned systems power loss.  This type of power loss at a systems level can result in file systems corruption which will be seen in loss of data, corrupted data, and potential operating system or applications corruption or failure.  This has the strong potential to an operator system out of operation until repairs can be implemented.

2. Power outages severe enough to cause failure of some of the localized UPS's results in unplanned systems power loss[1].  This type of power loss at a systems level can result in accelerated hardware failure due to potential for disk crash, power supply failure, and thermal cycling of systems components.  This has the strong potential to an operator system out of operation until repairs can be implemented.

**Recommendations**

The customer has engaged assistance in identifying potential building power infrastructure core problems and remediation.  This process should be followed through to completion.

The power grid issues are probably not solvable in the short term or even midterm.  To mediate the power grid issues should be remediated as quickly as possible through the use of large power regulator and UPS systems that are directly connected to the electrical panels which feed the individual circuits within the operations center.  A power expert should be consulted to determine the proper equipment to provide protection from power anomalies caused by the power grid.  A survey of the power provided to the facility from the grid will identify the main issues.  Expected issues would include high inductive spikes during outages and restoration of power and power fluctuations.  Solutions may include large ferrous core transformers to eliminate inductive spikes being passed to the local power panel, and UPS to provide power during brown and black outs.
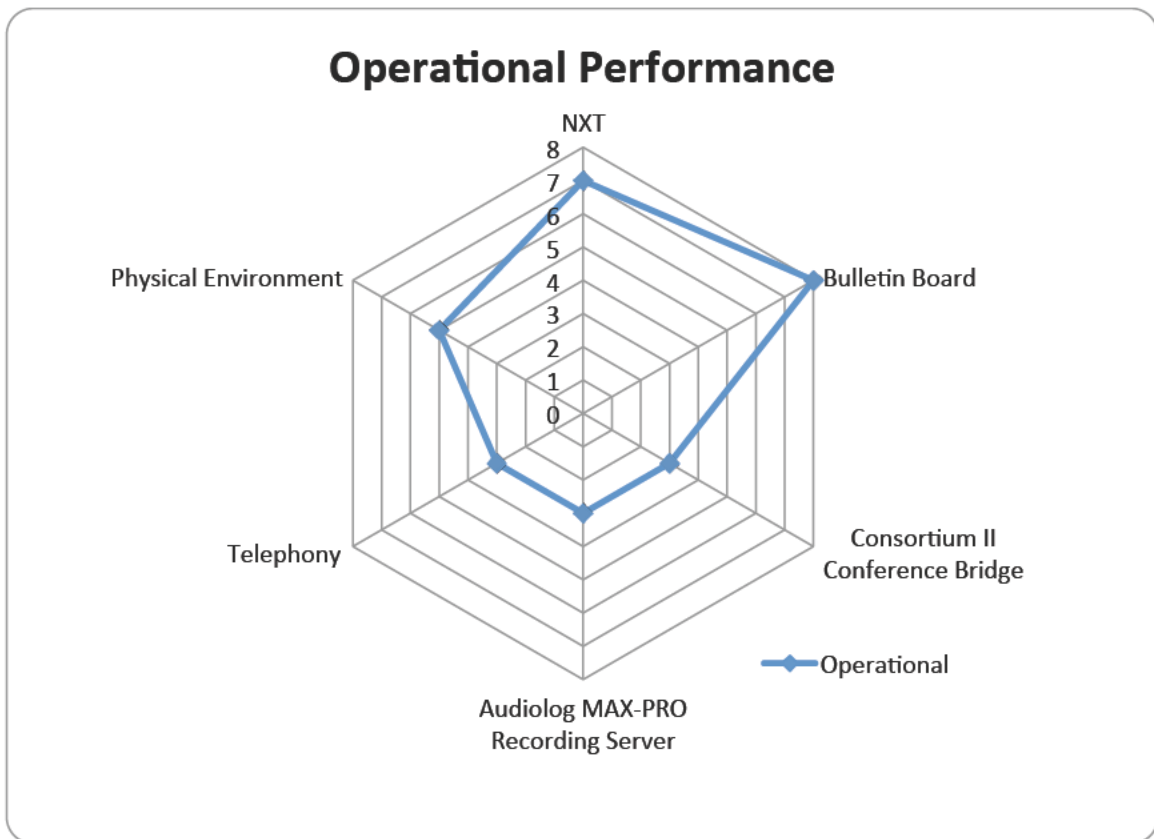
## RADAR CHARTS

Radar charts, sometimes referred to as spider web charts, provide a graphical representation of multivariate data to provide a view of the "big picture".  These

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[1] The failure of the localized UPS's was reported through the customer.

charts must be viewed in the context of the supporting data presented earlier in this report to have a full understanding of actual issues.
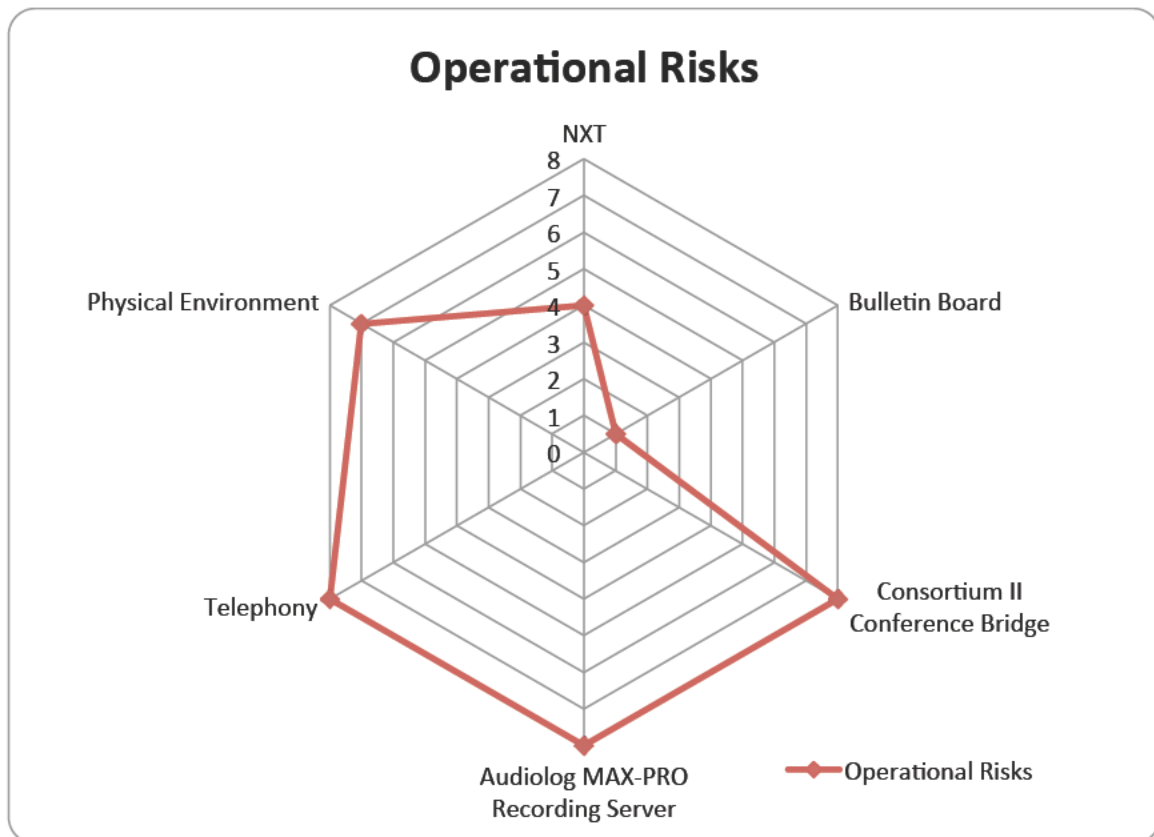
**Operational Performance**

The operational performance radar chart shows that the DCC Bulletin Board has the highest overall operational performance with the DCC NXT being a close second.  This chart also indicates that the physical environment is less than optimal while the telephony and Audiolog MAX-PRO recording server are candidates for significant improvements in operational performance.  It is important to note that the Audiolog MAX-PRO recording server has a low operational performance mark due to the associated telephony issues.  Again a full review of the associated text is required to fully understand the represented data points.

**Operational Performance**

NXT

Physical Environment

Telephony

Audiolog MAX-PRO
Recording Server

Consortium II
Conference Bridge

Bulletin Board

◆ Operational

**Operational Risks**

The operational risk radar chart shows that the DCC Bulletin Board has the lowest overall operational risk with the DCC NXT being a close second. This chart also indicates that the Audiolog MAX-PRO recording server has the highest risk component. Note that the this result is directly related to the telephony issues. Again a full review of the associated text is required to fully understand the represented data points.



**Operational Risks**

NXT — Bulletin Board — Consortium II Conference Bridge — Audiolog MAX-PRO Recording Server — Telephony — Physical Environment

Operational Risks

## Performance and Risk Overlay

This chart is intended to provide a combined view of operational performance and risks.