Telecommunications Industry Association Business Performance Community (TIA-BPC)

TL 9000
Quality Management System

Measurements Handbook

NPR Examples

5.1 NPR Examples

In all product categories data are collected and reported over defined time periods. Normally data are collected and reported by the calendar month but TL 9000 also allows data to be collected and reported in certain other pre-defined time periods. The time period of collection is reported with the data in the annualization factor, NPRa, the number of reporting periods in a year. For data collected and reported monthly the annualization factor is 12, the number of months in a year. The permitted time periods for collecting and reporting data are listed in the definition of Annualization Factor in the Glossary.

5.1.1 – NPR for Product Categories 1, 2, 3, 4, 5, 6, and 9

Problem reports in this category are classified according to severity of impact on the customer (see counting rule 5.1.4 b) 8)). NPRs is the number of normalization units that could be the source of a problem report. The Normalization Unit (NU) for each product category is defined in Appendix A, Table A-2.

1) Consider one month's data for an organization of a particular Operational Support System (OSS). There are 30 systems in service during the entire month and NU is "systems." The organization received no critical, 3 major and 45 minor problem reports during the month on this product.
2) The data reported is shown in Table 5.1.1-1.

Table 5.1.1-1 NPR Data Table Report for Product Categories 1, 2, 3, 4, 5, 6, and 9

Identifier	Value
MeasurementID	NPR
NPRa	12
NPRs	30
Np1	0
Np2	3
Np3	45

3) The measurement calculation result is shown in Table 5.1.1-2.

Table 5.1.1-2 NPR Source Data and Measurement Calculations for Product Categories 1, 2, 3, 4, 5, 6, and 9

Problem Reports	Severity	Afactor	Normal-ization Units	NPR Measurement Result – Problem Reports per system per year
Np1 = 0	Critical	12	30	NPR1 = 0
Np2 = 3	Major	12	30	NPR2 = 1.2
Np3 = 45	Minor	12	30	NPR3 = 18

The calculation for NPR2 is 3 x 12 / 30 = 1.2 problem reports per system per year. The calculation for NPR3 is 45 x 12 / 30 = 18 problem reports per system per year.

5.1.2 – NPR for Service Products (Product Category 7)

1) Consider one month's data for an organization of a particular network field maintenance service. There are 200 network elements maintained during the entire month and NU is "network elements maintained." The organization received 30 problem reports pertaining to this service during the month.
2) The data reported is shown in Table 5.1.2-1.

Table 5.1.2-1 NPR Data Table Report for Product Category 7

Identifier	Value
Product Category	7.3.1
MeasurementID	NPR
NPRs	200
Np4	30

3) The measurement calculation result is shown in Table 5.1.2-2. Note that problem reports in product category 7 are not annualized.

Table 5.1.2-2 NPR Source Data and Measurements for Product Category 7

Problem Reports	Normalization Factor	NPR Measurement Result – Problem Reports per maintained network element per month
Np4 = 30	NPRs = 200	NPR4 = 0.15

The calculation of NPR4 is 30 / 200 = 0.15 problem reports per maintained network element per month.

5.1.3 – NPR for Product Categories 8 with an NU of Units Shipped

1. Consider one month's data for an organization of high-complexity printed circuit board assemblies, product category 8.2.3. The NU is "units shipped" meaning the number of units shipped in the 12 months ending with the reporting month are counted and reported. There were 500,000 units shipped during the twelve months ending with the report month.
2. The organization received 40 problem reports during the month. This may include problem reports on product shipped prior to the 12-month period used to determine the normalization unit quantity. For better understanding of "normalization units - shipped in the 12 months ending with the month being reported" consider this example. Now it is March: when calculating NPR of February 2014, the normalization units shall be the units shipped within March 2013 through February 2014.
3. The data reported is shown in Table 5.1.3-1.

Table 5.1.3-1 NPR Data Table Report for Product Category 8

Identifier	Value
Product Category	8.2.3
MeasurementID	NPR
NPRa	12
NPRs	500000
Np4	40

4) The measurement calculation result is shown in Table 5.1.3-2

Table 5.1.3-2 NPR Source Data and Measurements for Product Category 4

Problem Reports	Afactor	Normalization Units	NPR Measurement Result – Problem Reports per system per year
Np4 = 40	NPRa = 12	NPRs = 500000	NPR4 = 0.00096

The calculation of NPR4 is 12 * 40 / 500000 = 0.00096 problem reports per system per year.

5.1.4 – Use of Fiscal Months

If the data in example 5.1.3 were collected over a four-week fiscal month instead of a calendar month then the annualization factor (Afactor) is 13 and

NPR4 = 40 x 13 / 500,000 = 0.00104

Since the data is collected over a shorter period of time than the example in 5.1.3, the number of problem reports per system per year is higher.

5.1.5 – Problem Severity Determination

Following are various problem scenarios by severity level with the reason behind the severity classification. It is important to note that the severity classification is determined from the severity definitions contained in the Measurements Handbook Glossary based on the impact the problem had on the network. While important to formulating corrective and preventive action, the root cause of the problem is not directly related to the severity classification.

5.1.5.1 NPR- Severity Type- Critical Examples

a) Problem Description: Call gap in an intelligent network occurs due to an exhaustion of database resources. After a restart of the database, the network came back on line.

   Rationale: Whatever the cause, the call gap is a partial service outage and therefore a critical problem report due to product inoperability (total or partial outage).

b) Problem Description: The server fails. The failure causes all the terminals to fail to log in to the service system.

Rationale: According to the problem description, the failure has caused all of the terminals to fail to log in to the service system, affecting the servicing and the credit recording functions severely. Corrective action must be taken instantly, thus making this a critical problem report.

c) Problem Description: After a software upgrade, some cell sites cannot perform all services. The team analyzed the Key Performance Indicator (KPI) and found that some cells had 0 Radio Resource Control (RRC) setup request. Team found another 10 sites had the same problem.

   Rationale: The system cannot handle the RRC setup request after the software upgrade, seriously degrading network service. The severely degraded service makes this a critical problem report.

d) Problem Description: Local engineer reported that many users' mobile phone will re-start when communicating, and they can't be used normally.

   Rationale: The cause of the problem is found to be the network sending an exceptional Dual Tone Multi-Frequency (DTMF) message that can't be handled with the mobile phone, so that the mobile phone records are wrong and re-starts. Whatever the cause, this was a service-impacting problem and therefore classified as critical.

e) Problem Description: There is a problem with service after the upgrading of upper equipment. The traffic cannot transfer through the uplink port. The problem has effect 3 Digital Subscriber Line Access Multiplexers (DSLAMs)

   Rationale: Main service interruption is classified as a critical problem.

5.1.5.2 NPR- Severity Type- Major Examples

a) Problem Description: A process restarts often in Service Management Point (SMP) and there are lots of core files in the directory.

   Rationale: The restart interval is very short and has almost no effect on service. This is therefore a major problem report because of the reduction in product's capacity but still able to handle the expected load.

b) Problem Description: In the system function management, the account-based function does not work properly. The system cannot realize this function for accounts. When you add the account-based function, the system will not warn you. But, after this function is added and when you attempt to view the details of the receiving group of this function, the account information is empty. In other words, you fail to add an account to the function receiving group.

   Rationale: According to the problem description, the system cannot realize a function for accounts. The problem has affected the normal operation and management of the system but the system is usable. This problem is classified as major problem.

c) Problem Description: A circuit board at the site reports a Loss Of Frame (LOF) (a major alarm) when receiving normal power. All services are normal.

   Rationale: Unexpected major alarm, (LOF), degraded administrative and maintenance visibility of the product and diagnostic capability makes this a major problem report.

d) Problem Description: Random Access Channel (RACH) data congestion, even late at night. RRC setup successful rate of low priority service is unusually low.

Rationale: Data congestion, even the low priority service, cannot perform well. System is usable, but degraded making this a major problem report.

e) Problem Description: Mobile phone indicates voice mail has been received, but there is no actual content in the voice mail.

Rational: The erroneous indication of the receipt of voice mail causes the subscriber to check voice mail when there actually is none present.

f) Problem Description: The site reported that after executing an inquiry command the operation and maintenance board restarted and the operation and maintenance functionality was lost for a while then restored.

Rationale: Because the problem causes the loss of administrative or maintenance visibility, it is judged as a major problem.

g) Problem Description: For Internet Protocol Television (IPTV) services, when the subscriber changes the channel, the previous channel does not quit immediately, although “quick leave” function is enabled. The new channel can join successfully, and the previous channel will quit in 3 or 4 minutes so during this period, the subscriber can see two programs coming down at the same time. The quality is very bad.

Rationale: The degraded performance caused by having the previous channel superimposed on the new channel for a short period of time makes this a major problem.

5.1.5.3 NPR- Severity Type- Minor Examples

a) Problem Description: Call abandonment

Rationale: This is a normal “call loss” problem, doesn’t affect service, and so, is considered a minor problem.

b) Problem Description: A hard disk cannot be pulled out in Site A. A check of the other four sites reveals the problem is also found in two other sites. If you attempt to pull out a hard disk forcibly, it is found that the black decoration strip between disks protrudes. The spring sheets on both sides of the disk handles fail to exert its strength with the assistance of other springs. Therefore, the hard disk fails to be pulled out.

Rationale: According to the problem description, this problem causes the hard disk to be difficult to pull out. It's not necessary to pull out the hard disk frequently, and the hard disk has to be pulled out only when it has some problem. So this problem has not impaired the function of the system, and has little influence on the customer. This problem is classified as minor problem.

c) Problem Description: The Low Path-Remote Defect Indication (LP-RDI), a minor alarm, is reported in a circuit board in local site. All services are normal.

Rationale: Unexpected LP-RDI alarms degrade administrative and maintenance visibility of the product and diagnostic capability but the problem severity is low because LP-RDI is a minor alarm.

d) Problem Description: Mobile phone receives notes including special characters sent by mobile phones of other manufactures; the special characters are displayed as blanks.

Rationale: The special characters aren’t in the sustaining character range of current language version, but that will not affect consumers’ normal use of the mobile phone service.

e) Problem Description: The site reported that site equipment could not query the history statistics result. The statistics result structure of the site equipment was not set large enough during the original installation by the organization. After increasing the size of the statistics result structure, the problem was solved.

Rationale: Because the problem has a lesser severity than "critical" or "major", and has almost no impairment on the function of the system, it is judged as a minor problem.

5.1.6 Failure Analysis Requests

5.1.6.1 Scenarios:

A customer calls reporting a product failure and requests help to bring back service or functionality to normal. The following takes place:

- It is determined that an FRU should be replaced.
- An RMA is issued
- Customer replaces FRU bringing service or product functionality back to normal
- Customer agrees to close the case after getting back to normal.

In addition to the above scenario, the customer asks that the (assumed) defective FRU have Failure Analysis performed. From that point there are three possible scenarios:

1) FA does not find a problem, customer is notified and nothing is done except for the RMA.
2) FA does find a problem, customer is notified and nothing is done (other than adding the FA details to a data base for ongoing trend analysis) except for the RMA
3) FA does find a problem, customer is notified. FA triggers action to prevent the problem from recurring. It should be noted that one FA finding by itself will rarely trigger a preventive action. (In addition the FA details will be added to a data base for ongoing trend analysis)

5.1.6.2 Handling in NPR

Which, if any of the above scenarios (1, 2, or 3) should be counted as an NPR?

Certainly if the customer states in any fashion that this is a problem that they want “investigated and resolved to remove the cause” then it would be counted as an NPR.

Initially, there is a problem report in all three cases because the customer request for a full Failure Analysis has within it the inherent expectation that there will be an investigation, the FA itself, and appropriate corrective action will be taken. Scenario two may later be excluded if it turns out the failure was due to operation of the product outside of its expectations (5.1.4 c) 3 in R4.5, 5.1.4 c) 1) c) in R5.0).

5.1.7 Effect of Product or Service in Retirement Phase (MHB R5.6)

With Measurement Handbook R5.6, when a product or service is in Retirement Phase (or beyond), data will be excluded for this product or service from the monthly data submission. This exclusion also applies when a software product or a particular release of a software product is no longer deploying new features.

Consider one month’s data for an organization of a particular Operational Support System (OSS) for Product Category 4.2.1.1 where one of the products (or a specific release of a product) in the product category has entered Retirement Phase of the beginning of the month:

1) There are 30 network units in service during the entire month across all products in the product category and NU is “systems.” However, 5 of the systems are associated with the product in Retirement Phase so these sites will be excluded from the monthly data. The resulting NU count is 30-5 or 25
2) The organization received no critical, 3 major and 45 minor problem reports during the month across all products in this product category. However, 2 of the minor problems are associated with the product that is in Retirement phase so these problems will be excluded from the monthly data. The resulting minor problem count is 45-2 or 43.

The data reported is shown in Table 5.1.7-1.

Table 5.1.7-1 NPR Data Table Report for Product 4.2.1.1

Identifier	Value
MeasurementID	NPR
NPRa	12
NPRs	25
Np1	0
Np2	3
Np3	43

The measurement calculation result is shown in Table 5.1.7-2.

Table 5.1.7-2 NPR Source Data and Measurement Calculations for Product Category 4.2.1.1

Problem Reports	Severity	Afactor	Normal-ization Units	NPR Measurement Result – Problem Reports per system per year
Np1 = 0	Critical	12	25	NPR1 = 0
Np2 = 3	Major	12	25	NPR2 = 1.44
Np3 = 43	Minor	12	25	NPR3 = 20.64

The calculation for NPR2 is 3 x 12 / 25 = 1.44 problem reports per system per year. The calculation for NPR3 is 44 x 12 / 25 = 20.64 problem reports per system per year.