**3GPP TSG-SA5 Meeting #136-eS5-212271**

**e-meeting, 03 March - 09 March 2021**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **28.545** | **CR** | **0010** | **rev** | **1** | **Current version:** | 16.1.0 |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network | **X** |

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|  | | | | | | | | | | |
| ***Title:*** | Add missing Alarm Requirements and Use Cases | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | S5 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | TEI17 | | | | |  | ***Date:*** | | | 2021-03-05 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Add missing requirements and use cases for alarms to clarify expected functionality as well as to align within and across specifications:   * As specified in clause 6.1, 6.2 and 6.3, the notification notifyAlarmListRebuilt is part of the NSI, NSSI and NF Fault Supervision Data Report services. However corresponding requirements and use cases are currently missing. * An alarm can be of type ADAC (automatically cleared) or ADMC (manually cleared). If all alarms supported by a MnS producer are of type ADAC, then manual clearing use cases are not applicable. Update requirements to take this scenario into account. * As specified in TS 28.532 clause 11.2.1.2.1.1, some Fault Supervision MnS producers may not support alarm acknowledgement by the consumer. In that case the producer shall instead be able to automatically acknowledge alarms. Update requirements to take this scenario into account. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | * New use cases and requirements are added for the notifyAlarmListRebuilt notification. * Existing requirements for alarm clearing are updated to take into account that some producers may not support manual clearing of alarms. * Existing requirements for alarm acknowledgement are updated to take into account that some producers may not support manual acknowledgment of alarms. * Added abbreviations ADAC and ADMC. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Specifications are not fully aligned regarding alarm related functionality and requirements. Requirements and use cases for alarms do not cover all possible scenarios. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 3.2, 5.1.x, 5.1.y, 5.1.z, 5.2.1, 5.2.2, 5.2.3, 5.2.4, 5.2.5, 5.2.6 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | There is no new functionality mandated by this submission. It is only to clarify and align 28.545 to behaviour which may already be present. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

***First change***

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

ADAC Automatically Detected and Automatically Cleared

ADMC Automatically Detected and Manually Cleared

FS Fault Supervision

ME Managed Element

MnS Management Service

NSI Network Slice Instance

NSSI Network Slice Subnet Instance

VNF Virtualized Network Function

VNFC Virtualized Network Function Component

***Next change***

### 5.1.x Notify alarm list rebuilt for NSI alarms

| Use case stage | Evolution/Specification | <<Uses>> Related use |
| --- | --- | --- |
| **Goal** | To notify alarm list rebuilt for NSI alarms. |  |
| **Actors and Roles** | A producer of Fault Supervision Data Report service for NSI  An authorized consumer of Fault Supervision Data Report service for NSI |  |
| **Telecom resources** | N/A |  |
| **Assumptions** | N/A |  |
| **Pre-conditions** | An authorized consumer has subscribed to the alarm list rebuilt notification. |  |
| **Begins when** | The producer of Fault Supervision Data Report service for NSI detects that its alarm list has been rebuilt. |  |
| **Step 1 (M)** | The producer of Fault Supervision Data Report service for NSI generates an alarm list rebuilt notification. |  |
| **Step 2 (M)** | The producer of Fault Supervision Data Report service for NSI sends the generated notification to its authorized consumer if this notification satisfies the filter condition if exists. |  |
| **Ends when** | The notification is either received by the authorized consumer or suppressed by a notification filter in the subscription. |  |
| **Exceptions** | In case any of the mandatory steps in the use case fails |  |
| **Post-conditions** | N/A |  |
| **Traceability** | REQ-FSDR\_NSI-FUN-X |  |

### 5.1.y Notify alarm list rebuilt for NSSI alarms

| Use case stage | Evolution/Specification | <<Uses>> Related use |
| --- | --- | --- |
| **Goal** | To notify alarm list rebuilt for NSSI alarms. |  |
| **Actors and Roles** | A producer of Fault Supervision Data Report service for NSSI  An authorized consumer of Fault Supervision Data Report service for NSSI |  |
| **Telecom resources** | N/A |  |
| **Assumptions** | N/A |  |
| **Pre-conditions** | An authorized consumer has subscribed to the alarm list rebuilt notification. |  |
| **Begins when** | The producer of Fault Supervision Data Report service for NSSI detects that its alarm list has been rebuilt. |  |
| **Step 1 (M)** | The producer of Fault Supervision Data Report service for NSSI generates an alarm list rebuilt notification. |  |
| **Step 2 (M)** | The producer of Fault Supervision Data Report service for NSSI sends the generated notification to its authorized consumer if this notification satisfies the filter condition if exists. |  |
| **Ends when** | The notification is either received by the authorized consumer or suppressed by a notification filter in the subscription. |  |
| **Exceptions** | In case any of the mandatory steps in the use case fails |  |
| **Post-conditions** | N/A |  |
| **Traceability** | REQ-FSDR\_NSSI-FUN-X |  |

### 5.1.z Notify alarm list rebuilt for NF alarms

| Use case stage | Evolution/Specification | <<Uses>> Related use |
| --- | --- | --- |
| **Goal** | To notify alarm list rebuilt for NF alarms. |  |
| **Actors and Roles** | A producer of Fault Supervision Data Report service for NF  An authorized consumer of Fault Supervision Data Report service for NF |  |
| **Telecom resources** | N/A |  |
| **Assumptions** | N/A |  |
| **Pre-conditions** | An authorized consumer has subscribed to the alarm list rebuilt notification. |  |
| **Begins when** | The producer of Fault Supervision Data Report service for NF detects that its alarm list has been rebuilt. |  |
| **Step 1 (M)** | The producer of Fault Supervision Data Report service for NF generates an alarm list rebuilt notification. |  |
| **Step 2 (M)** | The producer of Fault Supervision Data Report service for NF sends the generated notification to its authorized consumer if this notification satisfies the filter condition if exists. |  |
| **Ends when** | The notification is either received by the authorized consumer or suppressed by a notification filter in the subscription. |  |
| **Exceptions** | In case any of the mandatory steps in the use case fails |  |
| **Post-conditions** | N/A |  |
| **Traceability** | REQ-FSDR\_NF-FUN-X |  |

***Next change***

### 5.2.1 Requirements for fault supervision data report service for NSI

**REQ-FSDR\_NSI-FUN-1** The fault supervision data report service for NSI shall have the capability to provide alarm notifications of an NSI to its authorized consumer.

**REQ-FSDR\_NSI-FUN-2** The fault supervision data report service for NSI shall have the capability to allow its authorized consumer to subscribe the alarm notifications of an NSI.

**REQ-FSDR\_NSI-FUN-3** The fault supervision data report service for NSI shall have the capability to allow its authorized consumer to unsubscribe the alarm notifications of an NSI.

**REQ-FSDR\_NSI-FUN-4** The fault supervision data report service for NSI shall have the capability to allow its authorized consumer to provide the filter for alarm notifications.

**REQ-FSDR\_NSI-FUN-5** The fault supervision data report service for NSI shall have the capability to provide the alarm list of an NSI.

**REQ-FSDR\_NSI-FUN-6** The fault supervision data report service for NSI shall have the capability to allow its authorized consumer to provide the filter for the alarms.

**REQ-FSDR\_NSI-FUN-7** The fault supervision data report service for NSI shall have the capability to provide changed alarm notifications of an NSI to its authorized consumer.

**REQ-FSDR\_NSI-FUN-8** The fault supervision data report service for NSI shall have the capability to provide cleared alarm notifications of an NSI to its authorized consumer.

**REQ-FSDR\_NSI-FUN-9** The fault supervision data report service for NSI shall have the capability to provide new generated alarm notifications of an NSI to its authorized consumer.

**REQ-FSDR\_NSI-FUN-X** The fault supervision data report service for NSI shall have the capability to provide alarm list rebuilt notifications to its authorized consumer whenever the alarm list is rebuilt.

### 5.2.2 Requirements for fault supervision data control service for NSI

**REQ-FSDC\_NSI-FUN-1** The fault supervision data control service for NSI shall have the capability to satisfy the request to acknowledge one or multiple alarms of an NSI. If this capability is not supported, then the producer shall be able to automatically acknowledge alarms.

**REQ-FSDC\_NSI-FUN-2** The fault supervision data control service for NSI shall have the capability to satisfy the request to clear one or multiple alarms of an NSI. This capability is only required if one or more of the alarms supported by the producer is of type ADMC.

**REQ-FSDC\_NSI-FUN-3** Void.

**REQ-FSDC\_NSI-FUN-4** The fault supervision data control service for NSI shall have the capability to provide acknowledgement state change notifications of an NSI to its authorized consumer.

### 5.2.3 Requirements for fault supervision data report service for NSSI

**REQ-FSDR\_NSSI-FUN-1** The fault supervision data report service for NSSI shall have the capability to provide alarm notifications of a network slice subnet instance to its authorized consumer.

**REQ-FSDR\_NSSI-FUN-2** The fault supervision data report service for NSSI shall have the capability to allow its authorized consumer to subscribe the alarm notifications of an NSSI.

**REQ-FSDR\_NSSI-FUN-3** The fault supervision data report service for NSSI shall have the capability to allow its authorized consumer to unsubscribe the alarm notifications of an NSSI.

**REQ-FSDR\_NSSI-FUN-4** The fault supervision data report service for NSSI shall have the capability to allow its authorized consumer to provide the filter for alarm notifications.

**REQ-FSDR\_NSSI-FUN-5** The fault supervision data report service for NSSI shall have the capability to provide the alarm list of an NSSI.

**REQ-FSDR\_NSSI-FUN-6** The fault supervision data report service for NSSI shall have the capability to allow its authorized consumer to provide the filter for the alarms.

**REQ-FSDR\_NSSI-FUN-7** The fault supervision data report service for NSSI shall have the capability to provide changed alarm notifications of an NSSI to its authorized consumer.

**REQ-FSDR\_NSSI-FUN-8** The fault supervision data report service for NSSI shall have the capability to provide cleared alarm notifications of an NSSI to its authorized consumer.

**REQ-FSDR\_NSSI-FUN-9** The fault supervision data report service for NSSI shall have the capability to provide new generated alarm notifications of an NSSI to its authorized consumer.

**REQ-FSDR\_NSSI-FUN-X** The fault supervision data report service for NSSI shall have the capability to provide alarm list rebuilt notifications to its authorized consumer whenever the alarm list is rebuilt

### 5.2.4 Requirements for fault supervision data control service for NSSI

**REQ-FSDC\_NSSI-FUN-1** The fault supervision data control service for NSSI shall have the capability to satisfy the request to acknowledge one or multiple alarms of an NSSI. If this capability is not supported, then the producer shall be able to automatically acknowledge alarms.

**REQ-FSDC\_NSSI-FUN-2** The fault supervision data control service for NSSI shall have the capability to satisfy the request to clear one or multiple alarms of an NSSI. This capability is only required if one or more of the alarms supported by the producer is of type ADMC.

**REQ-FSDC\_NSSI-FUN-3** Void.

**REQ-FSDC\_NSSI-FUN-4** The fault supervision data control service for NSSI shall have the capability to provide acknowledgement state change notifications of an NSSI to its authorized consumer.

### 5.2.5 Requirements for fault supervision data report service for NF

**REQ-FSDR\_NF-FUN-1** The fault supervision data report service for NF shall have the capability to provide alarm notifications of a network function instance to its authorized consumer.

**REQ-FSDR\_NF-FUN-2** The fault supervision data report service for NF shall have the capability to provide alarm notifications of virtualized resources correlated with an NF instance to its authorized consumer.

**REQ-FSDR\_NF-FUN-3** Thefault supervision data report service for NF shall have the capability to allow its authorized consumer to subscribe the alarm notifications of an NF instance.

**REQ-FSDR\_NF-FUN-4** Thefault supervision data report service for NF shall have the capability to allow its authorized consumer to unsubscribe the alarm notifications of an NF instance.

**REQ-FSDR\_NF-FUN-5** The fault supervision data report service for NF shall have the capability to allow its authorized consumer to provide the filter for alarm notifications.

**REQ-FSDR\_NF-FUN-6** The fault supervision data report service for NF shall have the capability to provide the alarm list of an NF instance.

**REQ-FSDR\_NF-FUN-7** The fault supervision data report service for NF shall have the capability to provide the alarm list of virtualized resources correlated with an NF instance.

**REQ-FSDR\_NF-FUN-8** The fault supervision data report service for NF shall have the capability to allow its authorized consumer to provide the filter for the alarms.

**REQ-FSDR\_NF-FUN-9** The fault supervision data report service for NF shall have the capability to provide changed alarm notifications of an NF instance to its authorized consumer.

**REQ-FSDR\_NF-FUN-10** The fault supervision data report service for NF shall have the capability to provide cleared alarm notifications of an NF instance to its authorized consumer.

**REQ-FSDR\_NF-FUN-11** The fault supervision data report service for NF shall have the capability to provide new generated alarm notifications of an NF instance to its authorized consumer.

**REQ-FSDR\_NF-FUN-X** The fault supervision data report service for NF shall have the capability to provide alarm list rebuilt notifications to its authorized consumer whenever the alarm list is rebuilt.5.2.6 Requirements for fault supervision data control service for NF.

**REQ-FSDC\_NF-FUN-1** The fault supervision data control service for NF shall have the capability to satisfy the request to acknowledge one or multiple alarms of an NF instance. If this capability is not supported, then the producer shall be able to automatically acknowledge alarms.

**REQ-FSDC\_NF-FUN-2** The fault supervision data control service for NF shall have the capability to satisfy the request to clear one or multiple alarms of an NF instance. This capability is only required if one or more of the alarms supported by the producer is of type ADMC.

**REQ-FSDC\_NF-FUN-3** Void.

**REQ-FSDC\_NF-FUN-4** The fault supervision data control service for NF shall have the capability to provide acknowledgement state change notifications of an NF instance to its authorized consumer.

***End of changes***