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The Printer Working Group

Internet Printing Protocol (IPP) Printer State Extensions v1.0

Status: Approved

Abstract: This document defines the new IPP Printer attributes "printer-alert" and "printer-alert-description" plus extensions to the IPP Printer attribute "printer-state-reasons" (defined in RFC 2911) and to the IANA Printer MIB textual convention "PrtAlertCodeTC" (originally published in RFC 3805) as follows:

- (a) A standard encoding of all of the machine-readable columnar objects in the 'prtAlertTable' defined in IETF Printer MIB v2 (RFC 3805) into substrings of values of the new IPP Printer "printer-alert" attribute defined in this document.
- (b) A standard encoding of the localized 'prtAlertDescription' columnar object in the 'prtAlertTable' defined in IETF Printer MIB v2 (RFC 3805) into values of the new IPP Printer "printer-alert-description" attribute defined in this document.
- (c) A standard mapping between the device errors and warnings in the 'PrtAlertCodeTC' textual convention defined in IANA Printer MIB and existing or new values (as needed) of the IPP Printer "printer-state-reasons" attribute defined in IPP/1.1.
- (d) A standard mapping between the finishing subunit types in the 'FinDeviceTypeTC' textual convention defined in IANA Finisher MIB (originally published in RFC 3806) and new specific values of the 'PrtAlertCodeTC' textual convention defined in IANA Printer MIB and new values of the IPP Printer "printer-state-reasons" attribute defined in IPP/1.1, for high fidelity support of finishing alerts.

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<ftp://ftp.pwg.org/pub/pwg/general/process/pwg-process30.pdf>

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<ftp://ftp.pwg.org/pub/pwg/candidates/cs-ippstate10-20090731-5100.9.pdf>

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In general, a PWG standard is a specification that is stable, well understood, and is technically competent, has multiple, independent and interoperable implementations with substantial operational experience, and enjoys significant public support.

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Members of the PWG and interested parties are encouraged to join the PWG and IPP WG mailing lists in order to participate in discussions, clarifications and review of the IPP Working Group product.

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1 Introduction

1.1 Scope

This document defines two new IPP Printer attributes "printer-alert" and "printer-alert-description" plus extensions to the IPP Printer attribute "printer-state-reasons" (defined in RFC 2911) and to the IANA Printer MIB textual convention "PrtAlertCodeTC" (originally published in RFC 3805) as follows:

- 1) A standard encoding of all of the machine-readable columnar objects in the 'prtAlertTable' defined in IETF Printer MIB v2 (RFC 3805) into substrings of values of the new IPP Printer "printer-alert" attribute defined in this document.
- 2) A standard encoding of the localized 'prtAlertDescription' columnar object in the 'prtAlertTable' defined in IETF Printer MIB v2 (RFC 3805) into values of the new IPP Printer "printer-alert-description" attribute defined in this document.
- 3) A standard mapping between the device errors and warnings in the 'PrtAlertCodeTC' textual convention defined in IANA Printer MIB and existing or new values (as needed) of the IPP Printer "printer-state-reasons" attribute defined in IPP/1.1.
- 4) A standard mapping between the finishing subunit types in the 'FinDeviceTypeTC' textual convention defined in IANA Finisher MIB (originally published in RFC 3806) and new specific values of the 'PrtAlertCodeTC' textual convention defined in IANA Printer MIB and new values of the IPP Printer "printer-state-reasons" attribute defined in IPP/1.1, for high fidelity support of finishing alerts.

1.2 Problem Statement

When deploying printers in enterprise networks, customers often disable SNMPv1 (RFC 1157), based on local security policy - and secure SNMPv3 (RFC 3414) is not widely supported by current printers. Therefore, alternative support for secure queries for printer device alerts is required to manage, provision, and service these non-SNMP network printers. IPP/1.1 (RFC 2911) can be securely deployed in enterprise networks, using TLS/1.0 (RFC 2246) and HTTP/1.1 Upgrade (RFC 2817), so an IPP solution to this requirement is attractive.

The IPP "printer-state-reasons" attribute was defined in IPP/1.1 (RFC 2911), but the mapping of printer device alerts from the 'prtAlertCode' object defined in Printer MIB v1/v2 (RFC 1759/3805) was very sparse.

2 Terminology

2.1 Conformance Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as defined in [RFC2119].

2.2 Printing Terminology

Normative definitions and semantics of printing terms are imported from IETF Printer MIB v2 [RFC3805], IETF Finisher MIB [RFC3806], and IETF IPP/1.1 [RFC2911].

This document also defines the following protocol roles in order to specify unambiguous conformance requirements:

IPP Client - Initiator of outgoing IPP session requests and sender of outgoing IPP operation requests (HTTP/1.0 Client [RFC1957] / HTTP/1.1 Client [RFC2616]).

IPP Printer - Listener for incoming IPP session requests and receiver of incoming IPP operation requests (HTTP/1.0 Server [RFC1957] / HTTP/1.1 Server [RFC2616]).

Printer MIB Agent - Receiver of incoming SNMP operation requests (SNMPv1 Agent [RFC1157] / SNMPv3 Command Responder [RFC3411]).

Printer MIB Client - Sender of outgoing SNMP operation requests (SNMPv1 Manager [RFC1157] / SNMPv3 Command Generator [RFC3411]).

3 Industry Standard Printing Model

3.1 Standard Model - ISO DPA

The industry standard printing model was first defined during the development of ISO Document Printing Application (DPA) [ISO10175]. All subsequent open printing standards refer extensively to ISO DPA for the semantics of printing attributes.

WARNING: In ISO DPA, the abstract Printer object has two distinct 'realizations', to wit, Physical Printer (device) and Logical Printer (service). As a result, the term 'Printer' was used to mean a Physical Print Device in the IETF Printer MIB v1/v2 [RFC1759] [RFC3805] and later ambiguously used to mean either a Logical Print Service or a Physical Print Device in IETF IPP/1.1 [RFC2911].

3.2 Print Device - Printer MIB

The Print Device was first described in the IETF Host Resources MIB v1 [RFC1514] (September 1993) which defined the 'hrDevicePrinter' OID value for the 'hrDeviceType' element of the 'hrDeviceTable' and defined the 'hrPrinterTable' containing the 'hrPrinterStatus' (enumeration) and 'hrPrinterDetectedErrorState' (bit-mask) elements.

The industry standard Print Device model was later defined in section 2 of the IETF Printer MIB v1 [RFC1759] (March 1995) and is preserved without change in the IETF Printer MIB v2 [RFC3805] (June 2004). The block diagram is excerpted below.

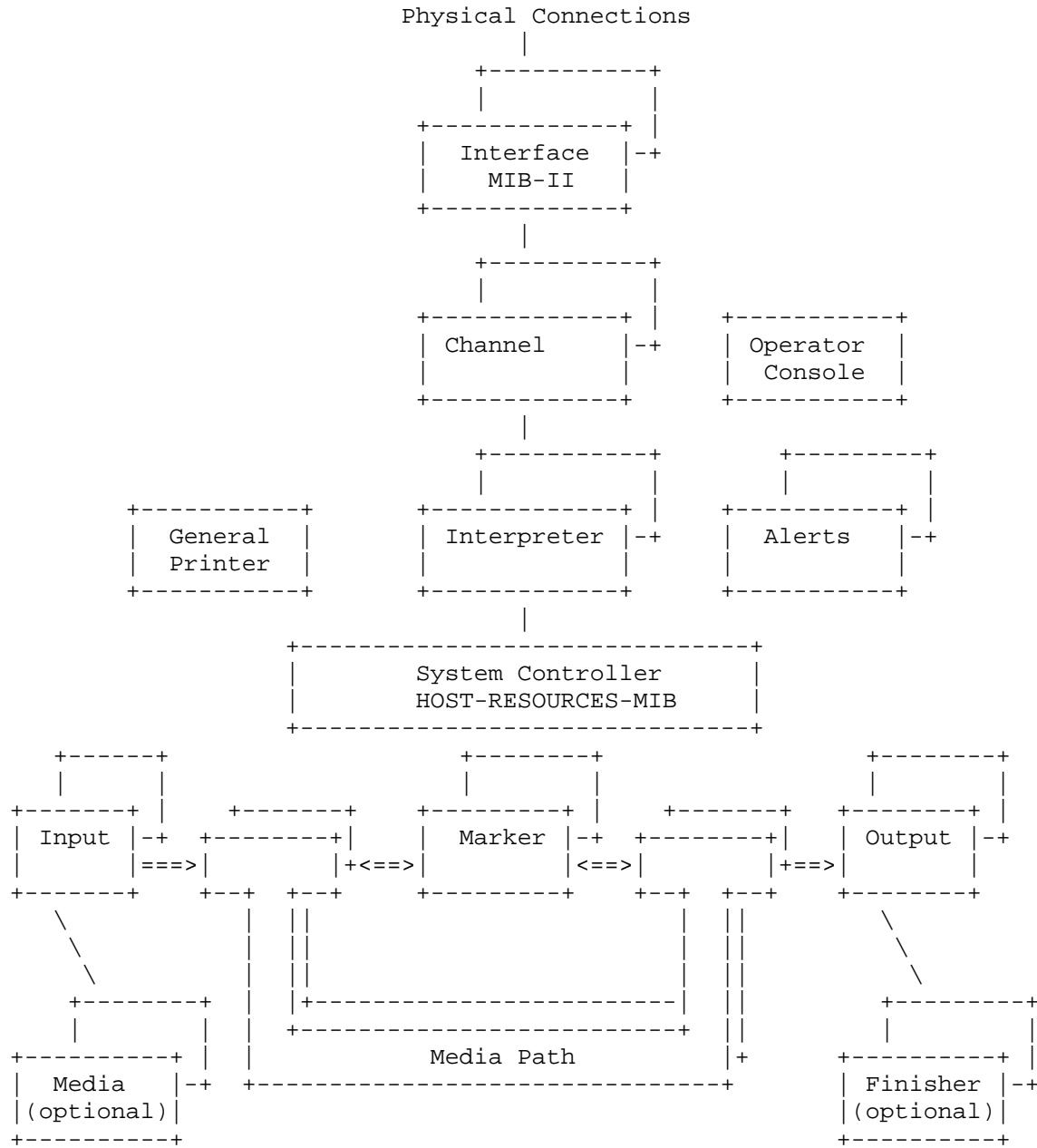


Figure 1 - Printer Block Diagram

3.3 Print Service and Print Device - IPP

A simplified printing model was defined in section 1.1 of IETF IPP/1.1 [RFC2911], based on ISO DPA [ISO10175]. The block diagram is excerpted below.

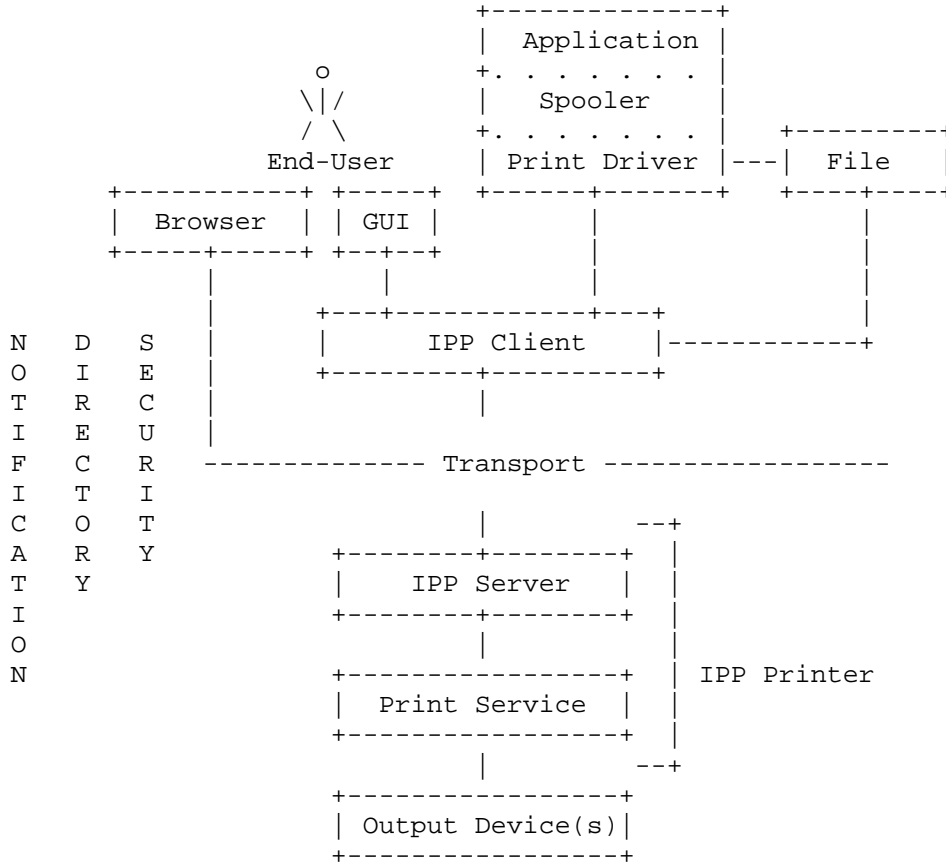


Figure 2 - Simplified Printing Model

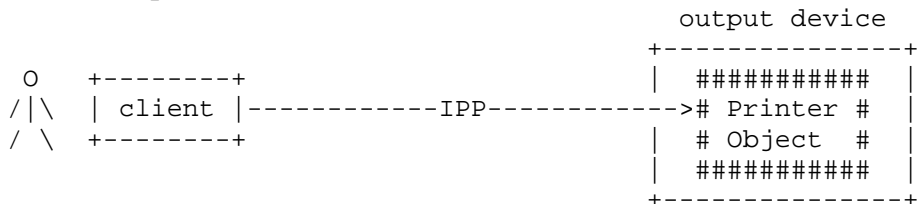
A simplified Print Service model and Print Device model was defined in section 2.1 of IETF IPP/1.1 [RFC2911], based on the logical and physical 'realizations' of the Printer object originally defined in ISO DPA [ISO10175]. The term Printer was ambiguously used to mean either a Logical Print Service or a Physical Print Device in IETF IPP/1.1 [RFC2911]. The block diagrams are excerpted below.

Legend:

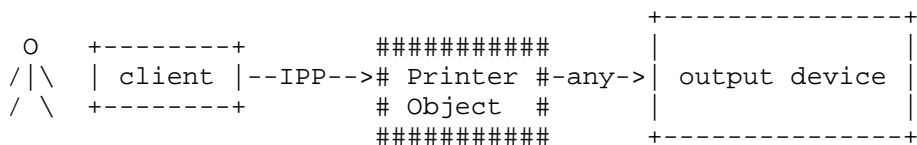
indicates a Printer object which is either embedded in an output device or is hosted in a server. The Printer object might or might not be capable of queuing/spooling.

any indicates any network protocol or direct connect, including IPP

embedded printer:



hosted printer:



fan out:

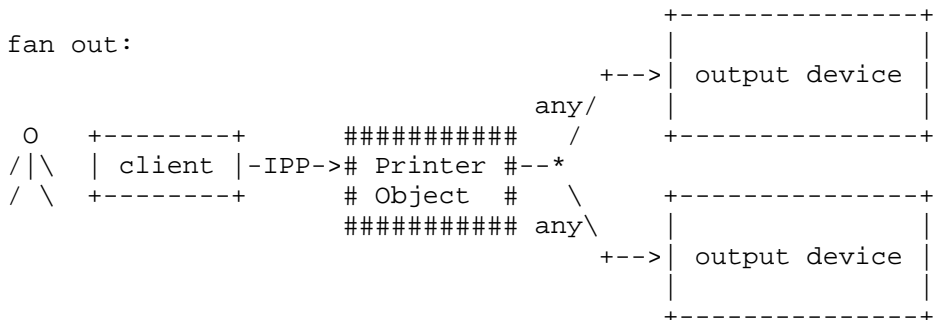


Figure 3 - Simplified Print Service and Print Device

4 Requirements

Per the PWG Process, this section specifies the formal rationale for developing an IPP Printer State Extensions (PSX) specification, based on existing printing industry standards. This section also describes simple use models for IPP PSX environments.

4.1 Rationale for IPP PSX

IETF and PWG standards for the printing industry define:

- a) A rationale for an abstract model of printing (to support alternate encodings and protocols) in section 3 of the IETF IPP Rationale [RFC2568].
- b) A set of design goals for status monitoring in a printing protocol in section 3.1.3 'Viewing the status and capabilities of a printer' (for End User), section 3.2.1 'Alerting' (for Operator), and section 3.3 'Administrator' (the bullet requirement to 'administrate billing or other charge-back mechanisms') of the IETF IPP Design Goals [RFC2567].
- c) An abstract model of a Print Service (i.e., ISO DPA Logical Printer) and a Print Device (i.e., ISO DPA Physical Printer) in section 2.1 of IETF IPP/1.1 [RFC2911].
- d) A partial set of Print Device alerts in the "printer-state-reasons" attribute in section 4.4.12 of IETF IPP/1.1 [RFC2911].
- e) An abstract model of a Print Device and contained Subunits in section 2.2 of the IETF Printer MIB v2 [RFC3805].
- f) A set of Print Device and Subunit types in the 'PrtAlertGroupTC' textual convention in IANA Printer MIB [IANAPRT], originally published in section 5 of the IETF Printer MIB v2 [RFC3805].
- g) A set of Print Device and Subunit alerts in the 'PrtAlertCodeTC' textual convention in IANA Printer MIB [IANAPRT], originally published in section 5 of the IETF Printer MIB v2 [RFC3805].
- h) An abstract model of Finishing Subunits integrated into the Printer Model (from [RFC3805]) in section 3 of the IETF Finisher MIB [RFC3806].
- i) A set of Finishing Subunit types in the 'FinDeviceTypeTC' textual convention in IANA Finisher MIB [IANAFIN], originally published in section 7 of the IETF Finisher MIB [RFC3806].

When deploying printers in enterprise networks, customers often disable SNMPv1 (RFC 1157), based on local security policy - and secure SNMPv3 (RFC 3414) is not widely supported by current printers.

Therefore an IPP PSX specification SHOULD:

- a) Standardize non-SNMP alternative support for secure queries for network printer device alerts;
- b) Standardize capabilities to manage, provision, and service these non-SNMP network printers;
- c) Encourage adoption of modern IPP-based printing infrastructures.

The IPP "printer-state-reasons" attribute was defined in IPP/1.1 (RFC 2911), but the mapping of printer device alerts from the 'prtAlertCode' object defined in Printer MIB v1/v2 (RFC 1759/3805) was very sparse.

To support monitoring, maintenance, and administration of these network printers, this document defines:

- (1) New enumerated values of the "PrtAlertCodeTC" textual convention for alerts for every Finishing Subunit type in the 'FinDeviceTypeTC' textual convention, for high fidelity alert mapping.

- (2) New keyword values for the "printer-state-reasons" attribute to complete the mapping for every Print Device and Subunit alert in the 'PrtAlertCodeTC' textual convention.
- (3) New keyword values for the new "printer-alert" attribute to encode all of the machine-readable columnar objects in 'prtAlertTable', for high fidelity alert mapping.
- (4) A new "printer-alert-description" attribute to encode the localized 'prtAlertDescription' object in 'prtAlertTable', to complete the Printer MIB to IPP Printer mapping.

4.2 Use Models for IPP PSX

4.2.1 Service Providers - Monitoring

Outside service providers may lease and maintain network printers in remote customer enterprise networks in different administrative domains.

Note: Typically monitoring proxies within customer enterprise networks are required for scalability of this use model. However, the deployment of monitoring proxies and of security credentials is outside the scope of this document.

- 1) To support reordering of supplies, outside service providers may read Device and Subunit alerts in "printer-state-reasons" from network printers that support IPP/1.1 (e.g., every day).
- 2) To support preventive maintenance, outside service providers may read Device and Subunit alerts in "printer-state-reasons" from network printers that support IPP/1.1 (e.g., every hour).
- 3) To support downtime guarantees, outside service providers may periodically read Device and Subunit alerts in "printer-state-reasons" from network printers that support IPP/1.1 (e.g., every 10 minutes).

4.2.2 System Administrators - Network Management

Network system administrators configure and manage Print Devices in local enterprise networks.

- 1) To support network management, network system administrators may subscribe to Print Device events from network printers that support IPP/1.1.
- 2) To support preventive maintenance, network system administrators may read Device and Subunit alerts in "printer-state-reasons" from network printers that support IPP/1.1 (e.g., every hour).
- 3) To support emergency maintenance, network system administrators may read Device and Subunit alerts in "printer-state-reasons", especially configuration changes and critical alerts, from network printers that support IPP/1.1 (e.g., every 10 minutes).

4.2.3 System Operators - Monitoring

Network system operators monitor Print Devices and manage Print Jobs in local enterprise networks.

- 1) To support Print Job management, network system operators may subscribe to Print Device and Print Job events from network printers that support IPP/1.1.
- 2) To support Print Device monitoring, network system operators may read Device and Subunit alerts in "printer-state-reasons", especially for low or empty supplies, from network printers that support IPP/1.1 (e.g., every hour).
- 3) To support Print Device availability, network system operators may read Device and Subunit alerts in "printer-state-reasons", especially for paper jams and other simple alerts, from network printers that support IPP/1.1 (e.g., every 10 minutes).

4.3 Design Requirements for IPP PSX

- (1) The IPP PSX design MUST follow the naming conventions defined in IETF IPP/1.1 [RFC2911], including keyword value case (lower) and hyphenation requirements.
- (2) The IPP PSX design MUST define a complete mapping between Print Device and Subunit existing values of 'PrtAlertCodeTC' in IANA Printer MIB [IANAPRT] and existing values or new values (as needed) of "printer-state-reasons".
- (3) The IPP PSX design MUST define Finishing Subunit-specific new values of 'PrtAlertCodeTC' for registration in IANA Printer MIB [IANAPRT] for every value of 'FinDeviceTypeTC' in IANA Finisher MIB [IANAFIN].
- (4) The IPP PSX design MUST define a standard encoding for all of the machine-readable columnar objects defined in the 'prtAlertTable' in IETF Printer MIB v2 (RFC 3805) as substrings of values of a new "printer-alert" attribute.
- (5) The IPP PSX design MUST define a standard encoding for the localized 'prtAlertDescription' columnar object defined in the 'prtAlertTable' in IETF Printer MIB v2 (RFC 3805) as text values of a new "printer-alert-description" attribute.

5 IPP Printer Attributes

5.1 printer-state-reasons (1setOf type2 keyword)

This section defines clarifications and extensions for the existing multi-valued IPP Printer "printer-state-reasons" attribute originally specified in IETF IPP/1.1 [RFC2911]. This IPP Printer attribute is REQUIRED for implementations that conform to this specification. Specific values and mappings to/from the IETF Printer MIB v2 [RFC3805] are defined in detail below.

5.1.1 Severity Suffixes Interoperability

The severity suffixes ('-report', '-error', and '-warning') for values of the existing IPP Printer "printer-state-reasons" attribute are defined in section 4.4.12 of [RFC2911]. These values have NOT been IANA-registered because:

- 1) They are not valid for the attribute syntax 'keyword' defined in section 4.1.3 of [RFC2911].
- 2) They are structurally incompatible with the IANA IPP Registry [IANAIPP] as defined in section 6 of [RFC2911].

5.1.1.1 Conformance

- 1) For interoperability, IPP implementations that claim conformance to this specification SHOULD implement special-case parsing and validation for the severity suffixes for "printer-state-reasons" defined in [RFC2911].

5.1.2 Existing Printer State Reasons for Alert Codes

The table below shows existing values of "printer-state-reasons" [RFC2911] and their mapping from existing values of 'PrtAlertCodeTC' [IANAPRT].

Deprecated Mappings: Existing values of "printer-state-reasons" in Table 5-1 that are enclosed in parentheses are DEPRECATED because they define non-unique mappings and SHOULD NOT be implemented. Instead, the new specific mappings defined in Table 5-2 SHOULD be implemented.

Table 5-1 - Existing Printer State Reasons for Alert Codes

<u>PrtAlertCodeTC</u>	<u>printer-state-reasons</u>
-- RFC 1759 Generic codes	
other(1)	other
unknown(2)	
coverOpen(3)	cover-open
coverClosed(4)	
interlockOpen(5)	interlock-open
interlockClosed(6)	
configurationChange(7)	
jam(8)	media-jam
-- RFC 3805 Generic codes	
subunitMissing(9)	
subunitLifeAlmostOver(10)	
subunitLifeOver(11)	
subunitAlmostEmpty(12)	
subunitEmpty(13)	
subunitAlmostFull(14)	
subunitFull(15)	
subunitNearLimit(16)	
subunitAtLimit(17)	
subunitOpened(18)	
subunitClosed(19)	
subunitTurnedOn(20)	
subunitTurnedOff(21)	
subunitOffline(22)	
subunitPowerSaver(23)	
subunitWarmingUp(24)	
subunitAdded(25)	
subunitRemoved(26)	
subunitResourceAdded(27)	
subunitResourceRemoved(28)	
subunitRecoverableFailure(29)	
subunitUnrecoverableFailure(30)	
subunitRecoverableStorageError(31)	
subunitUnrecoverableStorageError(32)	
subunitMotorFailure(33)	
subunitMemoryExhausted(34)	
subunitUnderTemperature(35)	
subunitOverTemperature(36)	
subunitTimingFailure(37)	
subunitThermistorFailure(38)	
-- General Printer Group	

```

doorOpen(501) (door-open)
  -- DEPRECATED -- use coverOpen(3)
doorClosed(502)
  -- DEPRECATED -- use coverClosed(4)
powerUp(503)
powerDown(504) (shutdown)
printerNMSReset(505)
printerManualReset(506)
printerReadyToPrint(507)

-- Input Group
inputMediaTrayMissing(801) input-tray-missing
inputMediaSizeChange(802)
inputMediaWeightChange(803)
inputMediaTypeChange(804)
inputMediaColorChange(805)
inputMediaFormPartsChange(806)
inputMediaSupplyLow(807) media-low
inputMediaSupplyEmpty(808) media-empty
inputMediaChangeRequest(809) media-needed
inputManualInputRequest(810)
inputTrayPositionFailure(811)
inputTrayElevationFailure(812)
inputCannotFeedSizeSelected(813)

-- Output Group
outputMediaTrayMissing(901) output-tray-missing
outputMediaTrayAlmostFull(902) output-area-almost-full
outputMediaTrayFull(903) output-area-full
outputMailboxSelectFailure(904)

-- Marker Group
markerFuserUnderTemperature(1001) fuser-under-temp
markerFuserOverTemperature(1002) fuser-over-temp
markerFuserTimingFailure(1003)
markerFuserThermistorFailure(1004)
markerAdjustingPrintQuality(1005)

-- Marker Supplies Group
markerTonerEmpty(1101) toner-empty
markerInkEmpty(1102) (marker-supply-empty)
markerPrintRibbonEmpty(1103) (marker-supply-empty)
markerTonerAlmostEmpty(1104) toner-low
markerInkAlmostEmpty(1105) (marker-supply-low)
markerPrintRibbonAlmostEmpty(1106) (marker-supply-low)
markerWasteTonerReceptacleAlmostFull(1107) (marker-waste-almost-full)
markerWasteInkReceptacleAlmostFull(1108) (marker-waste-almost-full)
markerWasteTonerReceptacleFull(1109) (marker-waste-full)
markerWasteInkReceptacleFull(1110) (marker-waste-full)
markerOpcLifeAlmostOver(1111) opc-near-eol
markerOpcLifeOver(1112) opc-life-over
markerDeveloperAlmostEmpty(1113) (marker-supply-low)
markerDeveloperEmpty(1114) (marker-supply-empty)
markerTonerCartridgeMissing(1115)

```

```
-- Media Path Group
mediaPathMediaTrayMissing(1301)
mediaPathMediaTrayAlmostFull(1302)
mediaPathMediaTrayFull(1303)
mediaPathCannotDuplexMediaSelected(1304)

-- Interpreter Group
interpreterMemoryIncrease(1501)
interpreterMemoryDecrease(1502)
interpreterCartridgeAdded(1503)
interpreterCartridgeDeleted(1504)
interpreterResourceAdded(1505)
interpreterResourceDeleted(1506)
interpreterResourceUnavailable(1507)    interpreter-resource-unavailable
interpreterComplexPageEncountered(1509)

-- Alert Group
alertRemovalOfBinaryChangeEntry(1801)
    -- A binary change alert has been removed
```

5.1.2.1 Conformance

- 1) For interoperability, IPP implementations that claim conformance to this specification **MUST** implement the Table 5-1 standard mappings between existing values of "printer-state-reasons" [RFC2911] and existing values of 'PrtAlertCodeTC' [IANAPRT].
- 2) For interoperability, IPP implementations that claim conformance to this specification **SHOULD NOT** implement the Table 5-1 deprecated mappings (enclosed in parentheses) between existing values of "printer-state-reasons" [RFC2911] and existing values of 'PrtAlertCodeTC' [IANAPRT]. Instead, the new specific mappings defined in Table 5-2 **SHOULD** be implemented.

5.1.3 New Printer State Reasons for Alert Codes

The table below defines new values of "printer-state-reasons" [RFC2911] and their mapping from existing values of 'PrtAlertCodeTC' [IANAPRT]. Rows with a '---' value in "printer-state-reasons" indicate existing values "printer-state-reasons" that were originally defined in [RFC2911] (e.g., 'jam'). IPP implementations that claim conformance to this specification therefore support a complete and precise mapping of "printer-state-reasons" from original values of 'PrtAlertCodeTC' [IANAPRT] defined in [RFC 3805].

Table 5-2 - New Printer State Reasons for Alert Codes

<u>PrtAlertCodeTC</u>	<u>printer-state-reasons</u>
-- RFC 1759 Generic codes	
other(1)	---
unknown(2)	unknown
coverOpen(3)	---
coverClosed(4)	cover-closed
interlockOpen(5)	---
interlockClosed(6)	interlock-closed
configurationChange(7)	configuration-change
jam(8)	---
-- RFC 3805 Generic codes	
subunitMissing(9)	subunit-missing
subunitLifeAlmostOver(10)	subunit-life-almost-over
subunitLifeOver(11)	subunit-life-over
subunitAlmostEmpty(12)	subunit-almost-empty
subunitEmpty(13)	subunit-empty
subunitAlmostFull(14)	subunit-almost-full
subunitFull(15)	subunit-full
subunitNearLimit(16)	subunit-near-limit
subunitAtLimit(17)	subunit-at-limit
subunitOpened(18)	subunit-opened
subunitClosed(19)	subunit-closed
subunitTurnedOn(20)	subunit-turned-on
subunitTurnedOff(21)	subunit-turned-off
subunitOffline(22)	subunit-offline
subunitPowerSaver(23)	subunit-power-saver
subunitWarmingUp(24)	subunit-warming-up
subunitAdded(25)	subunit-added
subunitRemoved(26)	subunit-removed
subunitResourceAdded(27)	subunit-resource-added
subunitResourceRemoved(28)	subunit-resource-removed
subunitRecoverableFailure(29)	subunit-recoverable-failure
subunitUnrecoverableFailure(30)	subunit-unrecoverable-failure
subunitRecoverableStorageError(31)	subunit-recoverable-storage-error
subunitUnrecoverableStorageError(32)	subunit-unrecoverable-storage-error
subunitMotorFailure(33)	subunit-motor-failure
subunitMemoryExhausted(34)	subunit-memory-exhausted
subunitUnderTemperature(35)	subunit-under-temperature
subunitOverTemperature(36)	subunit-over-temperature
subunitTimingFailure(37)	subunit-timing-failure
subunitThermistorFailure(38)	subunit-thermistor-failure
-- General Printer Group	
doorOpen(501)	---

```

    -- DEPRECATED -- use coverOpen(3)
doorClosed(502)                                cover-closed
    -- DEPRECATED -- use coverClosed(4)
powerUp(503)                                   power-up
powerDown(504)                                 power-down
printerNMSReset(505)                          printer-nms-reset
printerManualReset(506)                      printer-manual-reset
printerReadyToPrint(507)                    printer-ready-to-print

-- Input Group
inputMediaTrayMissing(801)                    ---
inputMediaSizeChange(802)                   input-media-size-change
inputMediaWeightChange(803)                 input-media-weight-change
inputMediaTypeChange(804)                  input-media-type-change
inputMediaColorChange(805)                 input-media-color-change
inputMediaFormPartsChange(806)             input-media-form-parts-change
inputMediaSupplyLow(807)                   ---
inputMediaSupplyEmpty(808)                 ---
inputMediaChangeRequest(809)              ---
inputManualInputRequest(810)              input-manual-input-request
inputTrayPositionFailure(811)             input-tray-position-failure
inputTrayElevationFailure(812)           input-tray-elevation-failure
inputCannotFeedSizeSelected(813)         input-cannot-feed-size-selected

-- Output Group
outputMediaTrayMissing(901)                ---
outputMediaTrayAlmostFull(902)            ---
outputMediaTrayFull(903)                  ---
outputMailboxSelectFailure(904)          output-mailbox-select-failure

-- Marker Group
markerFuserUnderTemperature(1001)          ---
markerFuserOverTemperature(1002)          ---
markerFuserTimingFailure(1003)           marker-fuser-timing-failure
markerFuserThermistorFailure(1004)       marker-fuser-thermistor-failure
markerAdjustingPrintQuality(1005)        marker-adjusting-print-quality

-- Marker Supplies Group
markerTonerEmpty(1101)                    ---
markerInkEmpty(1102)                      marker-ink-empty
markerPrintRibbonEmpty(1103)             marker-print-ribbon-empty
markerTonerAlmostEmpty(1104)             ---
markerInkAlmostEmpty(1105)              marker-ink-almost-empty
markerPrintRibbonAlmostEmpty(1106)       marker-print-ribbon-almost-empty
markerWasteTonerReceptacleAlmostFull(1107)
                                           almost-
                                           full
markerWasteInkReceptacleAlmostFull(1108)
almost-full                               marker-waste-ink-receptacle-
markerWasteTonerReceptacleFull(1109)     marker-waste-toner-receptacle-
full
markerWasteInkReceptacleFull(1110)       marker-waste-ink-receptacle-full
markerOpcLifeAlmostOver(1111)            ---
markerOpcLifeOver(1112)                  ---
markerDeveloperAlmostEmpty(1113)         marker-developer-almost-empty
markerDeveloperEmpty(1114)              marker-developer-empty
markerTonerCartridgeMissing(1115)        marker-toner-cartridge-missing

```

```

-- Media Path Group
mediaPathMediaTrayMissing(1301)          media-path-media-tray-missing
mediaPathMediaTrayAlmostFull(1302)      media-path-media-tray-almost-full
mediaPathMediaTrayFull(1303)            media-path-media-tray-full
mediaPathCannotDuplexMediaSelected(1304) media-path-cannot-duplex-media-
selected

-- Interpreter Group
interpreterMemoryIncrease(1501)          interpreter-memory-increase
interpreterMemoryDecrease(1502)          interpreter-memory-decrease
interpreterCartridgeAdded(1503)          interpreter-cartridge-added
interpreterCartridgeDeleted(1504)        interpreter-cartridge-deleted
interpreterResourceAdded(1505)           interpreter-resource-added
interpreterResourceDeleted(1506)         interpreter-resource-deleted
interpreterResourceUnavailable(1507)     ---
interpreterComplexPageEncountered(1509)  interpreter-complex-page-
encountered

-- Alert Group
alertRemovalOfBinaryChangeEntry(1801)  alert-removal-of-binary-change-entry
-- A binary change alert has been removed

```

5.1.3.1 Conformance

- 1) For interoperability, IPP implementations that claim conformance to this specification MUST implement the Table 5-2 standard mappings between new values of "printer-state-reasons" [RFC2911] and existing values of 'PrtAlertCodeTC' [IANAPRT].

5.1.4 New PrinterState Reasons for Finishing Subunits

See the Table 6-1 'New Alert Codes for Finishing Subunits' in section 6.1.1 that shows new values of "printer-state-reasons" [RFC2911] and their mapping from new values of 'PrtAlertCodeTC' [IANAPRT] for Finishing Subunits.

5.1.4.1 Conformance

- 1) For interoperability, IPP implementations that claim conformance to this specification MUST implement the Table 6-1 mapping standards between new values of "printer-state-reasons" [RFC2911] and new values of 'PrtAlertCodeTC' [IANAPRT] for Finishing Subunits.

5.2 printer-alert (1setOf octetString(MAX))

This section defines the new multi-valued IPP Printer "printer-alert" attribute. This IPP Printer attribute is REQUIRED for implementations that conform to this specification

5.2.1 Keywords for Alert Objects

The table below defines keywords for "printer-alert" for all of the machine-readable columnar objects in 'prtAlertTable' [RFC3805]:

Note: The conformance levels in this table have been harmonized with:

- 1) The bindings of the 'printerV2Alert' notification defined in IETF Printer MIB v2 [RFC3805];
- 2) Section 9 'Event Notification Content' in IETF IPP Event Notifications and Subscriptions [RFC3995]; and
- 3) DMTF/PWG CIM modelling of Printer MIB [WIMS-CIM].

Table 5-3 - Keywords for Alert Objects

<u>Alert Object</u>	<u>Datatype</u>	<u>printer-alert tag</u>	<u>Conformance</u>
prtAlertCode	String	code	REQUIRED
prtAlertIndex	Integer	index	RECOMMENDED
prtAlertSeverityLevel	String	severity	RECOMMENDED
prtAlertTrainingLevel	String	training	OPTIONAL
prtAlertGroup	String	group	RECOMMENDED
prtAlertGroupIndex	Integer	group-index	RECOMMENDED
prtAlertLocation	Integer	location	RECOMMENDED
prtAlertTime	Integer	time	OPTIONAL

5.2.1.1 Conformance

- 1) For interoperability, IPP implementations that claim conformance to this specification MUST implement the new REQUIRED IPP Printer "printer-alert" attribute.
- 2) For interoperability, IPP implementations that claim conformance to this specification and implement the new "printer-alert" attribute MUST implement the Table 5-3 standard mappings between keywords in "printer-alert" and existing labels of 'prtAlertTable' objects [RFC3805].
- 3) For interoperability, IPP implementations that claim conformance to this specification MUST implement the Table 5-3 keywords defined as REQUIRED.
- 4) For interoperability, IPP implementations that claim conformance to this specification SHOULD implement the Table 5-3 keywords defined as RECOMMENDED.

5.2.1.2 Rationale for Omission of prtAlertDescription

In this specification, a mapping of the human-readable, localized 'prtAlertDescription' object is NOT defined in "printer-alert" but rather in a separate new "printer-alert-description" attribute, for the following reasons:

- 1) To define such a mapping, where only _part_ of the resulting "printer-alert" attribute is localized, would be technically impossible to specify in ABNF [RFC5234].
- 2) To define such a mapping, without a fixed charset (because of localized content) would be technically impossible to specify in ABNF [RFC5234].

- 3) To implement such a mapping, if the value of the IPP Printer "charset-configured" attribute was different from the value of prtLocalizationCharacterSet selected by prtGeneralCurrentLocalization, would require that the IPP implementation performed (potentially lossy) charset conversion.
- 4) To implement such a mapping, if the value of the IPP Printer "natural-language-configured" attribute was different from the combined values of prtLocalizationLanguage and prtLocalizationCountry selected by prtGeneralCurrentLocalization, would require that the IPP implementation performed (potentially lossy) message translation.

5.2.2 Printer Alert Encoding of Alert Objects

Values of the new IPP Printer "printer-alert" attribute MUST be encoded using a visible subset of the [US-ASCII] charset. Control codes (0x00 to 0x1F and 0x7F) MUST NOT be used. The ABNF [RFC5234] below defines the standard encoding in "printer-alert" for all of the machine-readable (non-localized) columnar objects in 'prtAlertTable' [RFC3805]:

```
printer-alert      = alert-code *[";" alert-element]
                    ; set of alert elements encoded into one value

alert-code        = "code" "=" 1*ALPHA
                    ; enumerated value as an alpha string (e.g., 'coverOpen')
                    ; 'prtAlertCode' in IETF Printer MIB v2 [RFC3805] mapped to label
                    ; in 'PrtAlertCodeTC' in IANA Printer MIB [IANAPRT]

alert-element     = alert-index /
                    alert-severity /
                    alert-training /
                    alert-group /
                    alert-group-index /
                    alert-location /
                    alert-time

alert-index       = "index" "=" 1*DIGIT
                    ; integer value as a numeric string mapped directly mapped from
                    ; 'prtAlertIndex' in [RFC1759] [RFC3805]

alert-severity    = "severity" "=" 1*ALPHA
                    ; enumerated value as an alpha string (e.g., 'critical') mapped
                    ; from 'prtAlertSeverityLevel' in [RFC1759] [RFC3805] to label
                    ; in 'PrtAlertSeverityLevelTC' in IANA Printer MIB [IANAPRT]

alert-training    = "training" "=" 1*ALPHA
                    ; enumerated value as an alpha string (e.g., 'fieldService') mapped
                    ; from 'prtAlertTrainingLevel' in [RFC1759] [RFC3805] to label
                    ; in 'PrtAlertTrainingLevelTC' in IANA Printer MIB [IANAPRT]

alert-group       = "group" "=" 1*ALPHA
                    ; enumerated value as an alpha string (e.g., 'markerSupplies')
                    ; mapped from 'prtAlertGroup' in [RFC1759] [RFC3805] to label
                    ; in 'PrtAlertGroupTC' in IANA Printer MIB [IANAPRT]

alert-group-index = "groupindex" "=" 1*DIGIT
                    ; integer value as a numeric string mapped directly mapped from
                    ; 'prtAlertGroupIndex' in [RFC1759] [RFC3805]

alert-location    = "location" "=" 1*DIGIT
                    ; integer value as a numeric string mapped directly mapped from
                    ; 'prtAlertLocation' in [RFC1759] [RFC3805]

alert-time        = "time" "=" 1*DIGIT
                    ; integer value as a numeric string mapped directly mapped from
                    ; 'prtAlertTime' in [RFC1759] [RFC3805]
```

Figure 4 - ABNF for IPP printer-alert

5.2.2.1 Conformance

- 1) For interoperability, IPP implementations that claim conformance to this specification MUST implement the new REQUIRED IPP Printer "printer-alert" attribute.
- 2) For interoperability, IPP implementations that claim conformance to this specification MUST implement the above standard encoding in "printer-alert" of machine-readable values of existing 'prtAlertTable' columnar objects [RFC3805].

5.2.2.2 Rationale for Encoding of Enumerated Values

In this specification, enumerated values of 'prtAlertTable' objects (e.g., 'prtAlertSeverityLevel') are mapped to corresponding enumeration labels in "printer-alert" for the following reasons:

- 1) To define a strictly numeric mapping is (potentially) fragile and loses human-readability.
- 2) To define an alphabetic (keyword) mapping is consistent with the IPP design preference for 'keyword' (section 4.1.3 of [RFC2911]) rather than 'enum' (section 4.1.4 of [RFC2911]) attribute syntaxes.

5.2.2.3 Example of Printer Alert

The following example shows all REQUIRED and RECOMMENDED and some OPTIONAL columnar objects from 'prtAlertTable' encoded into two corresponding values of the IPP Printer "printer-alert" attribute for two distinct (but closely related) alerts. Line breaks are shown for readability of this example, but MUST NOT be encoded into actual values of "printer-alert".

```
printer-alert[1] =
  code=jam;index=22;severity=critical
  ;group=mediaPath;groupindex=4;location=6
printer-alert[2] =
  code=coverOpen;index=23;severity=critical
  ;group=cover;groupindex=6;location=8
```

Figure 5 - Example of IPP printer-alert

5.3 printer-alert-description (1setOf text(MAX))

This section defines the new multi-valued IPP Printer "printer-alert-description" attribute.. This IPP Printer attribute is REQUIRED for implementations that conform to this specification.

5.3.1 Printer Alert Description Encoding

Each text value of "printer-alert-description" MUST be mapped directly from the corresponding human-readable, localized value of 'prtAlertDescription' as follows:

- 1) Each value of 'prtAlertDescription' MUST be converted from the charset [RFC2978] [RFC3808] specified by 'prtLocalizationCharacterSet' and 'prtGeneralCurrentLocalization' to the charset specified by "charset-configured" (defaults to UTF-8 [RFC3629]) and then copied to a text value of "printer-alert-description".
- 2) Each value of "printer-alert-description" MUST be tagged with the natural language [RFC4646] specified by 'prtLocalizationLanguage', 'prtLocalizationCountry', and 'prtGeneralCurrentLocalization'.
- 3) Each value of "printer-alert-description" MUST be in the same order as the corresponding value of "printer-alert".

5.3.1.1 Conformance

- 1) For interoperability, IPP implementations that claim conformance to this specification MUST implement the new REQUIRED IPP Printer "printer-alert-description" attribute.
- 2) For interoperability, IPP implementations that claim conformance to this specification MUST implement the above standard encoding in "printer-alert-description" of human-readable, localized values of the 'prtAlertDescription' columnar object [RFC3805], including charset conversion and language tag copying.

5.3.2 Example of Printer Alert Description

The following example shows two instances of the localized 'prtAlertDescription' columnar object from 'prtAlertTable' encoded into two corresponding values of the IPP Printer "printer-alert-description" attribute for two distinct (but closely related) alerts.

```
printer-alert-description[1] =  
    'Critical alert - jam in media path at location 6'  
printer-alert-description[2] =  
    'Critical alert - cover open at location 8'
```

Figure 6 - Example of IPP printer-alert-description

6 IANA Printer MIB Textual Conventions

6.1 PrtAlertCodeTC

This section defines new values for the existing 'PrtAlertCodeTC' [IANAPRT] textual convention and also defines corresponding new values for the existing "printer-state-reasons" [RFC2911] attribute for registration with IANA. The REQUIRED finishing extensions to the the PrtAlertCodeTC textual convention defined in IANA Printer MIB are defined in detail below.

6.1.1 New Alert Codes for Finishing Subunits

The table below shows new values of "printer-state-reasons" [RFC2911] and their mapping from new values of 'PrtAlertCodeTC' [IANAPRT] and their algorithmic mapping from existing values of 'FinDeviceTypeTC' [IANAFIN].

Note: See section 6.1.1.3 'Rationale for Stapler and Stitcher Devices' and section 6.1.2 'Conventions for Alert Code Numbering' for discussion of the missing 'stapler' in IANA Finisher MIB [IANAFIN].

Table 6-1 - New Alert Codes for Finishing Subunits

<u>PrtAlertCodeTC</u>	<u>printer-state-reasons</u>
-- FinDeviceTypeTC = stitcher(3) -> stapler	
-- FinStitchingTypeTC = staple... (4,5,6,7, or 10)	
staplerCoverOpen(30203)	stapler-cover-open
staplerCoverClosed(30204)	stapler-cover-closed
staplerInterlockOpen(30205)	stapler-interlock-open
staplerInterlockClosed(30206)	stapler-interlock-closed
staplerConfigurationChange(30207)	stapler-configuration-change
staplerJam(30208)	stapler-jam
staplerMissing(30209)	stapler-missing
staplerLifeAlmostOver(30210)	stapler-life-almost-over
staplerLifeOver(30211)	stapler-life-over
staplerAlmostEmpty(30212)	stapler-almost-empty
staplerEmpty(30213)	stapler-empty
staplerAlmostFull(30214)	stapler-almost-full
staplerFull(30215)	stapler-full
staplerNearLimit(30216)	stapler-near-limit
staplerAtLimit(30217)	stapler-at-limit
staplerOpened(30218)	stapler-opened
staplerClosed(30219)	stapler-closed
staplerTurnedOn(30220)	stapler-turned-on
staplerTurnedOff(30221)	stapler-turned-off
staplerOffline(30222)	stapler-offline
staplerPowerSaver(30223)	stapler-power-saver
staplerWarmingUp(30224)	stapler-warming-up
staplerAdded(30225)	stapler-added
staplerRemoved(30226)	stapler-removed
staplerResourceAdded(30227)	stapler-resource-added
staplerResourceRemoved(30228)	stapler-resource-removed
staplerRecoverableFailure(30229)	stapler-recoverable-failure
staplerUnrecoverableFailure(30230)	stapler-unrecoverable-failure
staplerRecoverableStorageError(30231)	stapler-recoverable-storage-error
staplerUnrecoverableStorageError(30232)	stapler-unrecoverable-storage-error
staplerMotorFailure(30233)	stapler-motor-failure
staplerMemoryExhausted(30234)	stapler-memory-exhausted
staplerUnderTemperature(30235)	stapler-under-temperature
staplerOverTemperature(30236)	stapler-over-temperature
staplerTimingFailure(30237)	stapler-timing-failure

```

staplerThermistorFailure(30238)                stapler-thermistor-failure

-- FinDeviceTypeTC = stitcher(3) -> stitcher
-- FinStitchingTypeTC = saddleStitch(8) or edgeStitch(9)
stitcherCoverOpen(30303)                        stitcher-cover-open
stitcherCoverClosed(30304)                     stitcher-cover-closed
stitcherInterlockOpen(30305)                   stitcher-interlock-open
stitcherInterlockClosed(30306)                stitcher-interlock-closed
stitcherConfigurationChange(30307)            stitcher-configuration-change
stitcherJam(30308)                             stitcher-jam
stitcherMissing(30309)                         stitcher-missing
stitcherLifeAlmostOver(30310)                 stitcher-life-almost-over
stitcherLifeOver(30311)                       stitcher-life-over
stitcherAlmostEmpty(30312)                    stitcher-almost-empty
stitcherEmpty(30313)                          stitcher-empty
stitcherAlmostFull(30314)                     stitcher-almost-full
stitcherFull(30315)                           stitcher-full
stitcherNearLimit(30316)                      stitcher-near-limit
stitcherAtLimit(30317)                       stitcher-at-limit
stitcherOpened(30318)                         stitcher-opened
stitcherClosed(30319)                         stitcher-closed
stitcherTurnedOn(30320)                       stitcher-turned-on
stitcherTurnedOff(30321)                     stitcher-turned-off
stitcherOffline(30322)                        stitcher-offline
stitcherPowerSaver(30323)                     stitcher-power-saver
stitcherWarmingUp(30324)                      stitcher-warming-up
stitcherAdded(30325)                          stitcher-added
stitcherRemoved(30326)                       stitcher-removed
stitcherResourceAdded(30327)                  stitcher-resource-added
stitcherResourceRemoved(30328)                stitcher-resource-removed
stitcherRecoverableFailure(30329)             stitcher-recoverable-failure
stitcherUnrecoverableFailure(30330)           stitcher-unrecoverable-failure
stitcherRecoverableStorageError(30331)        stitcher-recoverable-storage-error
stitcherUnrecoverableStorageError(30332)      stitcher-unrecoverable-storage-error
stitcherMotorFailure(30333)                   stitcher-motor-failure
stitcherMemoryExhausted(30334)                stitcher-memory-exhausted
stitcherUnderTemperature(30335)               stitcher-under-temperature
stitcherOverTemperature(30336)                stitcher-over-temperature
stitcherTimingFailure(30337)                  stitcher-timing-failure
stitcherThermistorFailure(30338)              stitcher-thermistor-failure

-- FinDeviceTypeTC = folder(4)
folderCoverOpen(30403)                         folder-cover-open
folderCoverClosed(30404)                       folder-cover-closed
folderInterlockOpen(30405)                     folder-interlock-open
folderInterlockClosed(30406)                   folder-interlock-closed
folderConfigurationChange(30407)               folder-configuration-change
folderJam(30408)                               folder-jam
folderMissing(30409)                           folder-missing
folderLifeAlmostOver(30410)                    folder-life-almost-over
folderLifeOver(30411)                          folder-life-over
folderAlmostEmpty(30412)                       folder-almost-empty
folderEmpty(30413)                             folder-empty
folderAlmostFull(30414)                        folder-almost-full
folderFull(30415)                              folder-full
folderNearLimit(30416)                         folder-near-limit
folderAtLimit(30417)                           folder-at-limit
folderOpened(30418)                            folder-opened
folderClosed(30419)                            folder-closed
folderTurnedOn(30420)                          folder-turned-on
folderTurnedOff(30421)                         folder-turned-off
folderOffline(30422)                           folder-offline
folderPowerSaver(30423)                        folder-power-saver

```

folderWarmingUp(30424)	folder-warming-up
folderAdded(30425)	folder-added
folderRemoved(30426)	folder-removed
folderResourceAdded(30427)	folder-resource-added
folderResourceRemoved(30428)	folder-resource-removed
folderRecoverableFailure(30429)	folder-recoverable-failure
folderUnrecoverableFailure(30430)	folder-unrecoverable-failure
folderRecoverableStorageError(30431)	folder-recoverable-storage-error
folderUnrecoverableStorageError(30432)	folder-unrecoverable-storage-error
folderMotorFailure(30433)	folder-motor-failure
folderMemoryExhausted(30434)	folder-memory-exhausted
folderUnderTemperature(30435)	folder-under-temperature
folderOverTemperature(30436)	folder-over-temperature
folderTimingFailure(30437)	folder-timing-failure
folderThermistorFailure(30438)	folder-thermistor-failure
-- FinDeviceTypeTC = binder(5)	
binderCoverOpen(30503)	binder-cover-open
binderCoverClosed(30504)	binder-cover-closed
binderInterlockOpen(30505)	binder-interlock-open
binderInterlockClosed(30506)	binder-interlock-closed
binderConfigurationChange(30507)	binder-configuration-change
binderJam(30508)	binder-jam
binderMissing(30509)	binder-missing
binderLifeAlmostOver(30510)	binder-life-almost-over
binderLifeOver(30511)	binder-life-over
binderAlmostEmpty(30512)	binder-almost-empty
binderEmpty(30513)	binder-empty
binderAlmostFull(30514)	binder-almost-full
binderFull(30515)	binder-full
binderNearLimit(30516)	binder-near-limit
binderAtLimit(30517)	binder-at-limit
binderOpened(30518)	binder-opened
binderClosed(30519)	binder-closed
binderTurnedOn(30520)	binder-turned-on
binderTurnedOff(30521)	binder-turned-off
binderOffline(30522)	binder-offline
binderPowerSaver(30523)	binder-power-saver
binderWarmingUp(30524)	binder-warming-up
binderAdded(30525)	binder-added
binderRemoved(30526)	binder-removed
binderResourceAdded(30527)	binder-resource-added
binderResourceRemoved(30528)	binder-resource-removed
binderRecoverableFailure(30529)	binder-recoverable-failure
binderUnrecoverableFailure(30530)	binder-unrecoverable-failure
binderRecoverableStorageError(30531)	binder-recoverable-storage-error
binderUnrecoverableStorageError(30532)	binder-unrecoverable-storage-error
binderMotorFailure(30533)	binder-motor-failure
binderMemoryExhausted(30534)	binder-memory-exhausted
binderUnderTemperature(30535)	binder-under-temperature
binderOverTemperature(30536)	binder-over-temperature
binderTimingFailure(30537)	binder-timing-failure
binderThermistorFailure(30538)	binder-thermistor-failure
-- FinDeviceTypeTC = trimmer(6)	
trimmerCoverOpen(30603)	trimmer-cover-open
trimmerCoverClosed(30604)	trimmer-cover-closed
trimmerInterlockOpen(30605)	trimmer-interlock-open
trimmerInterlockClosed(30606)	trimmer-interlock-closed
trimmerConfigurationChange(30607)	trimmer-configuration-change
trimmerJam(30608)	trimmer-jam
trimmerMissing(30609)	trimmer-missing
trimmerLifeAlmostOver(30610)	trimmer-life-almost-over

trimmerLifeOver(30611)	trimmer-life-over
trimmerAlmostEmpty(30612)	trimmer-almost-empty
trimmerEmpty(30613)	trimmer-empty
trimmerAlmostFull(30614)	trimmer-almost-full
trimmerFull(30615)	trimmer-full
trimmerNearLimit(30616)	trimmer-near-limit
trimmerAtLimit(30617)	trimmer-at-limit
trimmerOpened(30618)	trimmer-opened
trimmerClosed(30619)	trimmer-closed
trimmerTurnedOn(30620)	trimmer-turned-on
trimmerTurnedOff(30621)	trimmer-turned-off
trimmerOffline(30622)	trimmer-offline
trimmerPowerSaver(30623)	trimmer-power-saver
trimmerWarmingUp(30624)	trimmer-warming-up
trimmerAdded(30625)	trimmer-added
trimmerRemoved(30626)	trimmer-removed
trimmerResourceAdded(30627)	trimmer-resource-added
trimmerResourceRemoved(30628)	trimmer-resource-removed
trimmerRecoverableFailure(30629)	trimmer-recoverable-failure
trimmerUnrecoverableFailure(30630)	trimmer-unrecoverable-failure
trimmerRecoverableStorageError(30631)	trimmer-recoverable-storage-error
trimmerUnrecoverableStorageError(30632)	trimmer-unrecoverable-storage-error
trimmerMotorFailure(30633)	trimmer-motor-failure
trimmerMemoryExhausted(30634)	trimmer-memory-exhausted
trimmerUnderTemperature(30635)	trimmer-under-temperature
trimmerOverTemperature(30636)	trimmer-over-temperature
trimmerTimingFailure(30637)	trimmer-timing-failure
trimmerThermistorFailure(30638)	trimmer-thermistor-failure
-- FinDeviceTypeTC = dieCutter(7)	
dieCutterCoverOpen(30703)	die-cutter-cover-open
dieCutterCoverClosed(30704)	die-cutter-cover-closed
dieCutterInterlockOpen(30705)	die-cutter-interlock-open
dieCutterInterlockClosed(30706)	die-cutter-interlock-closed
dieCutterConfigurationChange(30707)	die-cutter-configuration-change
dieCutterJam(30708)	die-cutter-jam
dieCutterMissing(30709)	die-cutter-missing
dieCutterLifeAlmostOver(30710)	die-cutter-life-almost-over
dieCutterLifeOver(30711)	die-cutter-life-over
dieCutterAlmostEmpty(30712)	die-cutter-almost-empty
dieCutterEmpty(30713)	die-cutter-empty
dieCutterAlmostFull(30714)	die-cutter-almost-full
dieCutterFull(30715)	die-cutter-full
dieCutterNearLimit(30716)	die-cutter-near-limit
dieCutterAtLimit(30717)	die-cutter-at-limit
dieCutterOpened(30718)	die-cutter-opened
dieCutterClosed(30719)	die-cutter-closed
dieCutterTurnedOn(30720)	die-cutter-turned-on
dieCutterTurnedOff(30721)	die-cutter-turned-off
dieCutterOffline(30722)	die-cutter-offline
dieCutterPowerSaver(30723)	die-cutter-power-saver
dieCutterWarmingUp(30724)	die-cutter-warming-up
dieCutterAdded(30725)	die-cutter-added
dieCutterRemoved(30726)	die-cutter-removed
dieCutterResourceAdded(30727)	die-cutter-resource-added
dieCutterResourceRemoved(30728)	die-cutter-resource-removed
dieCutterRecoverableFailure(30729)	die-cutter-recoverable-failure
dieCutterUnrecoverableFailure(30730)	die-cutter-unrecoverable-failure
dieCutterRecoverableStorageError(30731)	die-cutter-recoverable-storage-error
dieCutterUnrecoverableStorageError(30732)	die-cutter-unrecoverable-storage-error
dieCutterMotorFailure(30733)	die-cutter-motor-failure
dieCutterMemoryExhausted(30734)	die-cutter-memory-exhausted

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dieCutterUnderTemperature(30735)           die-cutter-under-temperature
dieCutterOverTemperature(30736)           die-cutter-over-temperature
dieCutterTimingFailure(30737)            die-cutter-timing-failure
dieCutterThermistorFailure(30738)        die-cutter-thermistor-failure

-- FinDeviceTypeTC = puncher(8)
puncherCoverOpen(30803)                   puncher-cover-open
puncherCoverClosed(30804)                 puncher-cover-closed
puncherInterlockOpen(30805)               puncher-interlock-open
puncherInterlockClosed(30806)            puncher-interlock-closed
puncherConfigurationChange(30807)         puncher-configuration-change
puncherJam(30808)                         puncher-jam
puncherMissing(30809)                     puncher-missing
puncherLifeAlmostOver(30810)              puncher-life-almost-over
puncherLifeOver(30811)                   puncher-life-over
puncherAlmostEmpty(30812)                 puncher-almost-empty
puncherEmpty(30813)                       puncher-empty
puncherAlmostFull(30814)                  puncher-almost-full
puncherFull(30815)                        puncher-full
puncherNearLimit(30816)                   puncher-near-limit
puncherAtLimit(30817)                     puncher-at-limit
puncherOpened(30818)                      puncher-opened
puncherClosed(30819)                      puncher-closed
puncherTurnedOn(30820)                    puncher-turned-on
puncherTurnedOff(30821)                   puncher-turned-off
puncherOffline(30822)                     puncher-offline
puncherPowerSaver(30823)                  puncher-power-saver
puncherWarmingUp(30824)                   puncher-warming-up
puncherAdded(30825)                       puncher-added
puncherRemoved(30826)                     puncher-removed
puncherResourceAdded(30827)                puncher-resource-added
puncherResourceRemoved(30828)             puncher-resource-removed
puncherRecoverableFailure(30829)          puncher-recoverable-failure
puncherUnrecoverableFailure(30830)        puncher-unrecoverable-failure
puncherRecoverableStorageError(30831)     puncher-recoverable-storage-error
puncherUnrecoverableStorageError(30832)   puncher-unrecoverable-storage-error
puncherMotorFailure(30833)                puncher-motor-failure
puncherMemoryExhausted(30834)             puncher-memory-exhausted
puncherUnderTemperature(30835)            puncher-under-temperature
puncherOverTemperature(30836)             puncher-over-temperature
puncherTimingFailure(30837)               puncher-timing-failure
puncherThermistorFailure(30838)           puncher-thermistor-failure

-- FinDeviceTypeTC = perforater(9)
perforaterCoverOpen(30903)                 perforater-cover-open
perforaterCoverClosed(30904)               perforater-cover-closed
perforaterInterlockOpen(30905)             perforater-interlock-open
perforaterInterlockClosed(30906)          perforater-interlock-closed
perforaterConfigurationChange(30907)       perforater-configuration-change
perforaterJam(30908)                       perforater-jam
perforaterMissing(30909)                   perforater-missing
perforaterLifeAlmostOver(30910)            perforater-life-almost-over
perforaterLifeOver(30911)                 perforater-life-over
perforaterAlmostEmpty(30912)               perforater-almost-empty
perforaterEmpty(30913)                     perforater-empty
perforaterAlmostFull(30914)                perforater-almost-full
perforaterFull(30915)                      perforater-full
perforaterNearLimit(30916)                 perforater-near-limit
perforaterAtLimit(30917)                   perforater-at-limit
perforaterOpened(30918)                     perforater-opened
perforaterClosed(30919)                     perforater-closed
perforaterTurnedOn(30920)                  perforater-turned-on
perforaterTurnedOff(30921)                 perforater-turned-off

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perforaterOffline(30922)
perforaterPowerSaver(30923)
perforaterWarmingUp(30924)
perforaterAdded(30925)
perforaterRemoved(30926)
perforaterResourceAdded(30927)
perforaterResourceRemoved(30928)
perforaterRecoverableFailure(30929)
perforaterUnrecoverableFailure(30930)
perforaterRecoverableStorageError(30931)
perforaterUnrecoverableStorageError(30932)

perforaterMotorFailure(30933)
perforaterMemoryExhausted(30934)
perforaterUnderTemperature(30935)
perforaterOverTemperature(30936)
perforaterTimingFailure(30937)
perforaterThermistorFailure(30938)

-- FinDeviceTypeTC = slitter(10)
slitterCoverOpen(31003)
slitterCoverClosed(31004)
slitterInterlockOpen(31005)
slitterInterlockClosed(31006)
slitterConfigurationChange(31007)
slitterJam(31008)
slitterMissing(31009)
slitterLifeAlmostOver(31010)
slitterLifeOver(31011)
slitterAlmostEmpty(31012)
slitterEmpty(31013)
slitterAlmostFull(31014)
slitterFull(31015)
slitterNearLimit(31016)
slitterAtLimit(31017)
slitterOpened(31018)
slitterClosed(31019)
slitterTurnedOn(31020)
slitterTurnedOff(31021)
slitterOffline(31022)
slitterPowerSaver(31023)
slitterWarmingUp(31024)
slitterAdded(31025)
slitterRemoved(31026)
slitterResourceAdded(31027)
slitterResourceRemoved(31028)
slitterRecoverableFailure(31029)
slitterUnrecoverableFailure(31030)
slitterRecoverableStorageError(31031)
slitterUnrecoverableStorageError(31032)
slitterMotorFailure(31033)
slitterMemoryExhausted(31034)
slitterUnderTemperature(31035)
slitterOverTemperature(31036)
slitterTimingFailure(31037)
slitterThermistorFailure(31038)

-- FinDeviceTypeTC = separationCutter(11)
separationCutterCoverOpen(31103)
separationCutterCoverClosed(31104)
separationCutterInterlockOpen(31105)
separationCutterInterlockClosed(31106)

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perforater-offline
perforater-power-saver
perforater-warming-up
perforater-added
perforater-removed
perforater-resource-added
perforater-resource-removed
perforater-recoverable-failure
perforater-unrecoverable-failure
perforater-recoverable-storage-error
perforater-unrecoverable-storage-error
perforater-motor-failure
perforater-memory-exhausted
perforater-under-temperature
perforater-over-temperature
perforater-timing-failure
perforater-thermistor-failure

slitter-cover-open
slitter-cover-closed
slitter-interlock-open
slitter-interlock-closed
slitter-configuration-change
slitter-jam
slitter-missing
slitter-life-almost-over
slitter-life-over
slitter-almost-empty
slitter-empty
slitter-almost-full
slitter-full
slitter-near-limit
slitter-at-limit
slitter-opened
slitter-closed
slitter-turned-on
slitter-turned-off
slitter-offline
slitter-power-saver
slitter-warming-up
slitter-added
slitter-removed
slitter-resource-added
slitter-resource-removed
slitter-recoverable-failure
slitter-unrecoverable-failure
slitter-recoverable-storage-error
slitter-unrecoverable-storage-error
slitter-motor-failure
slitter-memory-exhausted
slitter-under-temperature
slitter-over-temperature
slitter-timing-failure
slitter-thermistor-failure

separation-cutter-cover-open
separation-cutter-cover-closed
separation-cutter-interlock-open
separation-cutter-interlock-closed

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separationCutterConfigurationChange(31107)      separation-cutter-configuration-
                                                change
separationCutterJam(31108)                      separation-cutter-jam
separationCutterMissing(31109)                 separation-cutter-missing
separationCutterLifeAlmostOver(31110)          separation-cutter-life-almost-over
separationCutterLifeOver(31111)               separation-cutter-life-over
separationCutterAlmostEmpty(31112)            separation-cutter-almost-empty
separationCutterEmpty(31113)                  separation-cutter-empty
separationCutterAlmostFull(31114)             separation-cutter-almost-full
separationCutterFull(31115)                   separation-cutter-full
separationCutterNearLimit(31116)              separation-cutter-near-limit
separationCutterAtLimit(31117)                separation-cutter-at-limit
separationCutterOpened(31118)                 separation-cutter-opened
separationCutterClosed(31119)                 separation-cutter-closed
separationCutterTurnedOn(31120)               separation-cutter-turned-on
separationCutterTurnedOff(31121)              separation-cutter-turned-off
separationCutterOffline(31122)                separation-cutter-offline
separationCutterPowerSaver(31123)             separation-cutter-power-saver
separationCutterWarmingUp(31124)              separation-cutter-warming-up
separationCutterAdded(31125)                  separation-cutter-added
separationCutterRemoved(31126)                separation-cutter-removed
separationCutterResourceAdded(31127)          separation-cutter-resource-added
separationCutterResourceRemoved(31128)        separation-cutter-resource-removed
separationCutterRecoverableFailure(31129)     separation-cutter-recoverable-
                                                failure
separationCutterUnrecoverableFailure(31130)   separation-cutter-unrecoverable-
                                                failure
separationCutterRecoverableStorageError(31131) separation-cutter-recoverable-
                                                storage-error
separationCutterUnrecoverableStorageError(31132) separation-cutter-unrecoverable-
                                                storage-error
separationCutterMotorFailure(31133)           separation-cutter-motor-failure
separationCutterMemoryExhausted(31134)        separation-cutter-memory-exhausted
separationCutterUnderTemperature(31135)       separation-cutter-under-temperature
separationCutterOverTemperature(31136)        separation-cutter-over-temperature
separationCutterTimingFailure(31137)         separation-cutter-timing-failure
separationCutterThermistorFailure(31138)     separation-cutter-thermistor-failure

-- FinDeviceTypeTC = imprinter(12)
imprinterCoverOpen(31203)                     imprinter-cover-open
imprinterCoverClosed(31204)                   imprinter-cover-closed
imprinterInterlockOpen(31205)                 imprinter-interlock-open
imprinterInterlockClosed(31206)              imprinter-interlock-closed
imprinterConfigurationChange(31207)           imprinter-configuration-change
imprinterJam(31208)                           imprinter-jam
imprinterMissing(31209)                       imprinter-missing
imprinterLifeAlmostOver(31210)                imprinter-life-almost-over
imprinterLifeOver(31211)                     imprinter-life-over
imprinterAlmostEmpty(31212)                  imprinter-almost-empty
imprinterEmpty(31213)                         imprinter-empty
imprinterAlmostFull(31214)                    imprinter-almost-full
imprinterFull(31215)                          imprinter-full
imprinterNearLimit(31216)                     imprinter-near-limit
imprinterAtLimit(31217)                       imprinter-at-limit
imprinterOpened(31218)                       imprinter-opened
imprinterClosed(31219)                       imprinter-closed
imprinterTurnedOn(31220)                     imprinter-turned-on
imprinterTurnedOff(31221)                    imprinter-turned-off
imprinterOffline(31222)                      imprinter-offline
imprinterPowerSaver(31223)                   imprinter-power-saver
imprinterWarmingUp(31224)                    imprinter-warming-up
imprinterAdded(31225)                         imprinter-added
imprinterRemoved(31226)                       imprinter-removed

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imprinterResourceAdded(31227)
imprinterResourceRemoved(31228)
imprinterRecoverableFailure(31229)
imprinterUnrecoverableFailure(31230)
imprinterRecoverableStorageError(31231)
imprinterUnrecoverableStorageError(31232)

imprinterMotorFailure(31233)
imprinterMemoryExhausted(31234)
imprinterUnderTemperature(31235)
imprinterOverTemperature(31236)
imprinterTimingFailure(31237)
imprinterThermistorFailure(31238)

-- FinDeviceTypeTC = wrapper(13)
wrapperCoverOpen(31303)
wrapperCoverClosed(31304)
wrapperInterlockOpen(31305)
wrapperInterlockClosed(31306)
wrapperConfigurationChange(31307)
wrapperJam(31308)
wrapperMissing(31309)
wrapperLifeAlmostOver(31310)
wrapperLifeOver(31311)
wrapperAlmostEmpty(31312)
wrapperEmpty(31313)
wrapperAlmostFull(31314)
wrapperFull(31315)
wrapperNearLimit(31316)
wrapperAtLimit(31317)
wrapperOpened(31318)
wrapperClosed(31319)
wrapperTurnedOn(31320)
wrapperTurnedOff(31321)
wrapperOffline(31322)
wrapperPowerSaver(31323)
wrapperWarmingUp(31324)
wrapperAdded(31325)
wrapperRemoved(31326)
wrapperResourceAdded(31327)
wrapperResourceRemoved(31328)
wrapperRecoverableFailure(31329)
wrapperUnrecoverableFailure(31330)
wrapperRecoverableStorageError(31331)
wrapperUnrecoverableStorageError(31332)
wrapperMotorFailure(31333)
wrapperMemoryExhausted(31334)
wrapperUnderTemperature(31335)
wrapperOverTemperature(31336)
wrapperTimingFailure(31337)
wrapperThermistorFailure(31338)

-- FinDeviceTypeTC = bander(14)
banderCoverOpen(31403)
banderCoverClosed(31404)
banderInterlockOpen(31405)
banderInterlockClosed(31406)
banderConfigurationChange(31407)
banderJam(31408)
banderMissing(31409)
banderLifeAlmostOver(31410)
banderLifeOver(31411)
banderAlmostEmpty(31412)

imprinter-resource-added
imprinter-resource-removed
imprinter-recoverable-failure
imprinter-unrecoverable-failure
imprinter-recoverable-storage-error
imprinter-unrecoverable-storage-
error
imprinter-motor-failure
imprinter-memory-exhausted
imprinter-under-temperature
imprinter-over-temperature
imprinter-timing-failure
imprinter-thermistor-failure

wrapper-cover-open
wrapper-cover-closed
wrapper-interlock-open
wrapper-interlock-closed
wrapper-configuration-change
wrapper-jam
wrapper-missing
wrapper-life-almost-over
wrapper-life-over
wrapper-almost-empty
wrapper-empty
wrapper-almost-full
wrapper-full
wrapper-near-limit
wrapper-at-limit
wrapper-opened
wrapper-closed
wrapper-turned-on
wrapper-turned-off
wrapper-offline
wrapper-power-saver
wrapper-warming-up
wrapper-added
wrapper-removed
wrapper-resource-added
wrapper-resource-removed
wrapper-recoverable-failure
wrapper-unrecoverable-failure
wrapper-recoverable-storage-error
wrapper-unrecoverable-storage-error
wrapper-motor-failure
wrapper-memory-exhausted
wrapper-under-temperature
wrapper-over-temperature
wrapper-timing-failure
wrapper-thermistor-failure

bander-cover-open
bander-cover-closed
bander-interlock-open
bander-interlock-closed
bander-configuration-change
bander-jam
bander-missing
bander-life-almost-over
bander-life-over
bander-almost-empty

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banderEmpty(31413)	bander-empty
banderAlmostFull(31414)	bander-almost-full
banderFull(31415)	bander-full
banderNearLimit(31416)	bander-near-limit
banderAtLimit(31417)	bander-at-limit
banderOpened(31418)	bander-opened
banderClosed(31419)	bander-closed
banderTurnedOn(31420)	bander-turned-on
banderTurnedOff(31421)	bander-turned-off
banderOffline(31422)	bander-offline
banderPowerSaver(31423)	bander-power-saver
banderWarmingUp(31424)	bander-warming-up
banderAdded(31425)	bander-added
banderRemoved(31426)	bander-removed
banderResourceAdded(31427)	bander-resource-added
banderResourceRemoved(31428)	bander-resource-removed
banderRecoverableFailure(31429)	bander-recoverable-failure
banderUnrecoverableFailure(31430)	bander-unrecoverable-failure
banderRecoverableStorageError(31431)	bander-recoverable-storage-error
banderUnrecoverableStorageError(31432)	bander-unrecoverable-storage-error
banderMotorFailure(31433)	bander-motor-failure
banderMemoryExhausted(31434)	bander-memory-exhausted
banderUnderTemperature(31435)	bander-under-temperature
banderOverTemperature(31436)	bander-over-temperature
banderTimingFailure(31437)	bander-timing-failure
banderThermistorFailure(31438)	bander-thermistor-failure
-- FinDeviceTypeTC = makeEnvelope(15)	
makeEnvelopeCoverOpen(31503)	make-envelope-cover-open
makeEnvelopeCoverClosed(31504)	make-envelope-cover-closed
makeEnvelopeInterlockOpen(31505)	make-envelope-interlock-open
makeEnvelopeInterlockClosed(31506)	make-envelope-interlock-closed
makeEnvelopeConfigurationChange(31507)	make-envelope-configuration-change
makeEnvelopeJam(31508)	make-envelope-jam
makeEnvelopeMissing(31509)	make-envelope-missing
makeEnvelopeLifeAlmostOver(31510)	make-envelope-life-almost-over
makeEnvelopeLifeOver(31511)	make-envelope-life-over
makeEnvelopeAlmostEmpty(31512)	make-envelope-almost-empty
makeEnvelopeEmpty(31513)	make-envelope-empty
makeEnvelopeAlmostFull(31514)	make-envelope-almost-full
makeEnvelopeFull(31515)	make-envelope-full
makeEnvelopeNearLimit(31516)	make-envelope-near-limit
makeEnvelopeAtLimit(31517)	make-envelope-at-limit
makeEnvelopeOpened(31518)	make-envelope-opened
makeEnvelopeClosed(31519)	make-envelope-closed
makeEnvelopeTurnedOn(31520)	make-envelope-turned-on
makeEnvelopeTurnedOff(31521)	make-envelope-turned-off
makeEnvelopeOffline(31522)	make-envelope-offline
makeEnvelopePowerSaver(31523)	make-envelope-power-saver
makeEnvelopeWarmingUp(31524)	make-envelope-warming-up
makeEnvelopeAdded(31525)	make-envelope-added
makeEnvelopeRemoved(31526)	make-envelope-removed
makeEnvelopeResourceAdded(31527)	make-envelope-resource-added
makeEnvelopeResourceRemoved(31528)	make-envelope-resource-removed
makeEnvelopeRecoverableFailure(31529)	make-envelope-recoverable-failure
makeEnvelopeUnrecoverableFailure(31530)	make-envelope-unrecoverable-failure
makeEnvelopeRecoverableStorageError(31531)	make-envelope-recoverable-storage-error
makeEnvelopeUnrecoverableStorageError(31532)	make-envelope-unrecoverable-storage-error
makeEnvelopeMotorFailure(31533)	make-envelope-motor-failure
makeEnvelopeMemoryExhausted(31534)	make-envelope-memory-exhausted
makeEnvelopeUnderTemperature(31535)	make-envelope-under-temperature

makeEnvelopeOverTemperature(31536)	make-envelope-over-temperature
makeEnvelopeTimingFailure(31537)	make-envelope-timing-failure
makeEnvelopeThermistorFailure(31538)	make-envelope-thermistor-failure
-- FinDeviceTypeTC = stacker(16)	
stackerCoverOpen(31603)	stacker-cover-open
stackerCoverClosed(31604)	stacker-cover-closed
stackerInterlockOpen(31605)	stacker-interlock-open
stackerInterlockClosed(31606)	stacker-interlock-closed
stackerConfigurationChange(31607)	stacker-configuration-change
stackerJam(31608)	stacker-jam
stackerMissing(31609)	stacker-missing
stackerLifeAlmostOver(31610)	stacker-life-almost-over
stackerLifeOver(31611)	stacker-life-over
stackerAlmostEmpty(31612)	stacker-almost-empty
stackerEmpty(31613)	stacker-empty
stackerAlmostFull(31614)	stacker-almost-full
stackerFull(31615)	stacker-full
stackerNearLimit(31616)	stacker-near-limit
stackerAtLimit(31617)	stacker-at-limit
stackerOpened(31618)	stacker-opened
stackerClosed(31619)	stacker-closed
stackerTurnedOn(31620)	stacker-turned-on
stackerTurnedOff(31621)	stacker-turned-off
stackerOffline(31622)	stacker-offline
stackerPowerSaver(31623)	stacker-power-saver
stackerWarmingUp(31624)	stacker-warming-up
stackerAdded(31625)	stacker-added
stackerRemoved(31626)	stacker-removed
stackerResourceAdded(31627)	stacker-resource-added
stackerResourceRemoved(31628)	stacker-resource-removed
stackerRecoverableFailure(31629)	stacker-recoverable-failure
stackerUnrecoverableFailure(31630)	stacker-unrecoverable-failure
stackerRecoverableStorageError(31631)	stacker-recoverable-storage-error
stackerUnrecoverableStorageError(31632)	stacker-unrecoverable-storage-error
stackerMotorFailure(31633)	stacker-motor-failure
stackerMemoryExhausted(31634)	stacker-memory-exhausted
stackerUnderTemperature(31635)	stacker-under-temperature
stackerOverTemperature(31636)	stacker-over-temperature
stackerTimingFailure(31637)	stacker-timing-failure
stackerThermistorFailure(31638)	stacker-thermistor-failure
-- FinDeviceTypeTC = sheetRotator(17)	
sheetRotatorCoverOpen(31703)	sheet-rotator-cover-open
sheetRotatorCoverClosed(31704)	sheet-rotator-cover-closed
sheetRotatorInterlockOpen(31705)	sheet-rotator-interlock-open
sheetRotatorInterlockClosed(31706)	sheet-rotator-interlock-closed
sheetRotatorConfigurationChange(31707)	sheet-rotator-configuration-change
sheetRotatorJam(31708)	sheet-rotator-jam
sheetRotatorMissing(31709)	sheet-rotator-missing
sheetRotatorLifeAlmostOver(31710)	sheet-rotator-life-almost-over
sheetRotatorLifeOver(31711)	sheet-rotator-life-over
sheetRotatorAlmostEmpty(31712)	sheet-rotator-almost-empty
sheetRotatorEmpty(31713)	sheet-rotator-empty
sheetRotatorAlmostFull(31714)	sheet-rotator-almost-full
sheetRotatorFull(31715)	sheet-rotator-full
sheetRotatorNearLimit(31716)	sheet-rotator-near-limit
sheetRotatorAtLimit(31717)	sheet-rotator-at-limit
sheetRotatorOpened(31718)	sheet-rotator-opened
sheetRotatorClosed(31719)	sheet-rotator-closed
sheetRotatorTurnedOn(31720)	sheet-rotator-turned-on
sheetRotatorTurnedOff(31721)	sheet-rotator-turned-off
sheetRotatorOffline(31722)	sheet-rotator-offline

```
sheetRotatorPowerSaver(31723) sheet-rotator-power-saver
sheetRotatorWarmingUp(31724) sheet-rotator-warming-up
sheetRotatorAdded(31725) sheet-rotator-added
sheetRotatorRemoved(31726) sheet-rotator-removed
sheetRotatorResourceAdded(31727) sheet-rotator-resource-added
sheetRotatorResourceRemoved(31728) sheet-rotator-resource-removed
sheetRotatorRecoverableFailure(31729) sheet-rotator-recoverable-failure
sheetRotatorUnrecoverableFailure(31730) sheet-rotator-unrecoverable-failure
sheetRotatorRecoverableStorageError(31731) sheet-rotator-recoverable-storage-
error
sheetRotatorUnrecoverableStorageError(31732) sheet-rotator-unrecoverable-storage-
error
sheetRotatorMotorFailure(31733) sheet-rotator-motor-failure
sheetRotatorMemoryExhausted(31734) sheet-rotator-memory-exhausted
sheetRotatorUnderTemperature(31735) sheet-rotator-under-temperature
sheetRotatorOverTemperature(31736) sheet-rotator-over-temperature
sheetRotatorTimingFailure(31737) sheet-rotator-timing-failure
sheetRotatorThermistorFailure(31738) sheet-rotator-thermistor-failure

-- FinDeviceTypeTC = inserter(18)
inserterCoverOpen(31803) inserter-cover-open
inserterCoverClosed(31804) inserter-cover-closed
inserterInterlockOpen(31805) inserter-interlock-open
inserterInterlockClosed(31806) inserter-interlock-closed
inserterConfigurationChange(31807) inserter-configuration-change
inserterJam(31808) inserter-jam
inserterMissing(31809) inserter-missing
inserterLifeAlmostOver(31810) inserter-life-almost-over
inserterLifeOver(31811) inserter-life-over
inserterAlmostEmpty(31812) inserter-almost-empty
inserterEmpty(31813) inserter-empty
inserterAlmostFull(31814) inserter-almost-full
inserterFull(31815) inserter-full
inserterNearLimit(31816) inserter-near-limit
inserterAtLimit(31817) inserter-at-limit
inserterOpened(31818) inserter-opened
inserterClosed(31819) inserter-closed
inserterTurnedOn(31820) inserter-turned-on
inserterTurnedOff(31821) inserter-turned-off
inserterOffline(31822) inserter-offline
inserterPowerSaver(31823) inserter-power-saver
inserterWarmingUp(31824) inserter-warming-up
inserterAdded(31825) inserter-added
inserterRemoved(31826) inserter-removed
inserterResourceAdded(31827) inserter-resource-added
inserterResourceRemoved(31828) inserter-resource-removed
inserterRecoverableFailure(31829) inserter-recoverable-failure
inserterUnrecoverableFailure(31830) inserter-unrecoverable-failure
inserterRecoverableStorageError(31831) inserter-recoverable-storage-error
inserterUnrecoverableStorageError(31832) inserter-unrecoverable-storage-error
inserterMotorFailure(31833) inserter-motor-failure
inserterMemoryExhausted(31834) inserter-memory-exhausted
inserterUnderTemperature(31835) inserter-under-temperature
inserterOverTemperature(31836) inserter-over-temperature
inserterTimingFailure(31837) inserter-timing-failure
inserterThermistorFailure(31838) inserter-thermistor-failure
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6.1.1.1 Conformance

- 1) For interoperability, IPP implementations that claim conformance to this specification MUST implement the Table 6-1 standard mappings between existing values of 'FinDeviceTypeTC' [IANAFIN] and new values of 'PrtAlertCodeTC' [IANAPRT] and new values of "printer-state-reasons" [RFC2911].
- 2) For interoperability, IPP implementations that claim conformance to this specification MUST implement the Table 6-1 standard mappings between existing values of 'FinStitchingTypeTC' [IANAFIN] and new values of 'PrtAlertCodeTC' [IANAPRT] and new values of "printer-state-reasons" [RFC2911].

6.1.1.2 Rationale for New Finishing Alert Codes

In this specification, existing enumerated values of 'FinDeviceTypeTC' [IANAFIN] (e.g., 'binder(5)') are mapped algorithmically to new enumerated values of 'PrtAlertCodeTC' [IANAPRT] (e.g., 'binderJam(30508)') for the following reasons:

- 1) Unlike the base tables in IETF Printer MIB [RFC3805] (e.g., 'prtInputTable') which are mapped meaningfully to values of 'PrtAlertCodeTC' (e.g., 'inputMediaSizeChange(802)'), the base table in IETF Finisher MIB [RFC3805] ('finDeviceTable') is not currently mapped to meaningful specific alerts.
- 2) 'finDeviceTable' [RFC3806] entries are only distinguished by a non-indexed object ('finDeviceType') which is NOT included in 'prtAlertTable' (and therefore NOT mapped to "printer-alert").
- 3) Finishing alerts reported using the generic subunit alerts (e.g., 'subunitAlmostFull') are meaningless without a subsequent query of 'finDeviceTable' (impossible if SNMP is disabled).

6.1.1.3 Rationale for Separate Stapler and Stitcher Devices

In this specification the one value 'stitcher(3)' of 'FinDeviceTypeTC' [IANAFIN] is mapped algorithmically to two new sets of enumerated values of 'PrtAlertCodeTC' [IANAPRT] (e.g., 'staplerJam(30208)' and 'stitcherJam(30308)'), based on values of 'FinStitchingTypeTC' (e.g., 'stapleTopLeft(4)' and 'saddleStitch(8)') in the 'stitchingType(30)' attribute in 'finDeviceAttributeTable' for the following reasons:

- 1) Both 'staple' and 'stitch' finishing processes and devices are defined in section 2.2 'Process Specific Terminology' of IETF Finisher MIB [RFC3806].
- 2) But, unlike all other finishing processes in IETF Finisher MIB [RFC3806], the 'stapler' and 'stitcher' device types were merged into a single 'stitcher(3)' value of 'FinDeviceTypeTC' in IANA Finisher MIB [IANAFIN].
- 3) For the 'finDeviceType' non-indexed object in 'finDeviceTable' [RFC3806], the 'stapler' versus 'stitcher' finishing device types are only disambiguated via values of 'FinStitchingTypeTC' in IANA Finisher MIB [IANAFIN] for the 'stitchingType(30)' attribute in 'finDeviceAttributeTable' in the IETF Finisher MIB [RFC3806].

6.1.2 Conventions for Alert Code Numbering

Printer MIB v1/v2 [RFC1759] [RFC3805] follows a convention that values of 'PrtAlertCodeTC' (e.g., 'inputMediaTrayMissing(801)') are defined in ranges found by multiplying the corresponding value of 'PrtAlertGroupTC' (e.g., 'input(8)') by 100 and skipping the even hundred (e.g., '800'). For example, 'input(8)' maps to a range of '801' to '899'.

But specific alert codes for Finishing Subunits also need the context of the value of 'FinDeviceTypeTC' [IANAFIN] in the 'finDeviceType' non-index object in the 'finDeviceTable' [RFC3806], because this object is NOT encoded in 'prtAlertTable' [RFC3805].

Therefore, this specification defines a new convention that specific alert code values for Finishing Subunits (e.g., 'slitterJam(31001)') MUST be mapped from existing values of 'FinDeviceTypeTC' [IANAFIN] (e.g., 'slitter(10)') in ranges of '3nn01' to '3nn99', to avoid colliding with new alert groups that may be added to 'PrtAlertGroupTC' in the future.

This specification also defines a new convention specific alert code values for 'stapler' and 'stitcher' finishing. Device types are defined in two parallel ranges. See section 6.1.1.3 'Rationale for Stapler and 'Stitcher Devices' for more details.

7 Conformance Requirements

7.1 IPP Printer Conformance Requirements

To claim conformance to this specification, an IPP Printer implementation MUST support:

- 1) The REQUIRED IPP Printer attribute printer-state-reasons including the mappings of existing values (section 5.1.2) and new values (sections 5.1.3 and 5.1.4) defined in this specification.
- 2) The REQUIRED IPP Printer attribute printer-alert (section 5.2) defined in this specification.
- 3) The REQUIRED IPP Printer attribute printer-alert-description (section 5.3) defined in this specification.
- 4) The IDENTICAL set of REQUIRED IPP Printer attribute printer-alert.alert-code values as are supported in the corresponding prtAlertCode object defined in the IETF Printer MIB v2 [RFC3805] and/or the corresponding CodeName property defined in the the DMTF CIM_PrintAlertRecord class [CIMALERT].
- 5) The conformance requirements for an IPP Object specified in section 5.2 of [RFC2911].
- 6) The conformance requirements for IPP Internationalization Considerations (see section 9).
- 7) The conformance requirements for IPP Security Considerations (see section 10) defined in this specification.

7.2 IPP Client Conformance Requirements

To claim conformance to this specification, an IPP Client implementation MUST support:

- 1) The REQUIRED IPP Printer attribute printer-state-reasons including the mappings of existing values (section 5.1.2) and new values (sections 5.1.3 and 5.1.4) defined in this specification.
- 2) The REQUIRED IPP Printer attribute printer-alert (section 5.2) defined in this specification.
- 3) The REQUIRED IPP Printer attribute printer-alert-description (section 5.3) defined in this specification.
- 4) The IDENTICAL set of REQUIRED IPP Printer attribute printer-alert.alert-code values as are supported in the corresponding prtAlertCode object defined in the IETF Printer MIB v2 [RFC3805] and/or the corresponding CodeName property defined in the the DMTF CIM_PrintAlertRecord class [CIMALERT].
- 5) The conformance requirements for an IPP Object specified in section 5.2 of [RFC2911].
- 6) The conformance requirements for IPP Internationalization Considerations (see section 9).
- 7) The conformance requirements for IPP Security Considerations (see section 10) defined in this specification.

7.3 Printer MIB Agent Conformance Requirements

To claim conformance to this specification, a Printer MIB Agent implementation MUST support:

- 1) The IDENTICAL set of prtAlertCode object values defined in section 6.1 of this specification and in the IETF Printer MIB v2 [RFC3805] as are supported in the corresponding IPP printer-state-reasons attribute defined in section 5.1 of this specification and in IPP/1.1 [RFC2911] and/or the corresponding CodeName property defined in the the DMTF CIM_PrintAlertRecord class [CIMALERT].
- 2) All of the finishing prtAlertCode object values defined in section 6.1 of this specification that apply to the Printer MIB Agent implementation (i.e., for supported finishing device types).

7.4 Printer MIB Client Conformance Requirements

To claim conformance to this specification, a Printer MIB Client implementation MUST support:

- 1) The IDENTICAL set of prtAlertCode object values defined in section 6.1 of this specification and in the IETF Printer MIB v2 [RFC3805] as are supported in the corresponding IPP printer-state-reasons attribute defined in section 5.1 of this specification and in IPP/1.1 [RFC2911] and/or the corresponding CodeName property defined in the the DMTF CIM_PrintAlertRecord class [CIMALERT].
- 2) All of the finishing prtAlertCode object values defined in section 6.1 of this specification that apply to the Printer MIB Client implementation (i.e., for supported finishing device types).

8 IANA Considerations

8.1 IPP Attributes and Keyword Values Registrations

This section contains the updates for IANA to add to the IANA IPP Registry [IANAIPP] according to the procedures defined in section 6 of [RFC2911] to cover the definitions in this document. The resulting registrations will be published in:

<http://www.iana.org/assignments/ipp-registrations>

Table 8-1 - IPP Attributes and Keyword Values for IANA

Attribute Name (attribute syntax)	Reference	Section
printer-alert (1setOf octetString(MAX))	[PWG5100.9]	5.2
printer-alert-description (1setOf text(MAX))	[PWG5100.9]	5.3
printer-state-reasons (1setOf type2 keyword)	[RFC2911]	4.4.12
alert-removal-of-binary-change-entry	[PWG5100.9]	5.1.3
configuration-change	[PWG5100.9]	5.1.3
input-cannot-feed-size-selected	[PWG5100.9]	5.1.3
input-manual-input-request	[PWG5100.9]	5.1.3
input-media-color-change	[PWG5100.9]	5.1.3
input-media-form-parts-change	[PWG5100.9]	5.1.3
input-media-size-change	[PWG5100.9]	5.1.3
input-media-type-change	[PWG5100.9]	5.1.3
input-media-weight-change	[PWG5100.9]	5.1.3
input-tray-elevation-failure	[PWG5100.9]	5.1.3
input-tray-position-failure	[PWG5100.9]	5.1.3
interlock-closed	[PWG5100.9]	5.1.3
interpreter-cartridge-added	[PWG5100.9]	5.1.3
interpreter-cartridge-deleted	[PWG5100.9]	5.1.3
interpreter-complex-page-encountered	[PWG5100.9]	5.1.3
interpreter-memory-decrease	[PWG5100.9]	5.1.3
interpreter-memory-increase	[PWG5100.9]	5.1.3
interpreter-resource-added	[PWG5100.9]	5.1.3
interpreter-resource-deleted	[PWG5100.9]	5.1.3
marker-adjusting-print-quality	[PWG5100.9]	5.1.3
marker-developer-almost-empty	[PWG5100.9]	5.1.3
marker-developer-empty	[PWG5100.9]	5.1.3
marker-fuser-thermistor-failure	[PWG5100.9]	5.1.3
marker-fuser-timing-failure	[PWG5100.9]	5.1.3
marker-ink-almost-empty	[PWG5100.9]	5.1.3
marker-ink-empty	[PWG5100.9]	5.1.3
marker-print-ribbon-almost-empty	[PWG5100.9]	5.1.3
marker-print-ribbon-empty	[PWG5100.9]	5.1.3
marker-toner-cartridge-missing	[PWG5100.9]	5.1.3
marker-waste-ink-receptacle-almost-full	[PWG5100.9]	5.1.3
marker-waste-ink-receptacle-full	[PWG5100.9]	5.1.3
marker-waste-toner-receptacle-almost-full	[PWG5100.9]	5.1.3
marker-waste-toner-receptacle-full	[PWG5100.9]	5.1.3
media-path-cannot-duplex-media-selected	[PWG5100.9]	5.1.3
media-path-media-tray-almost-full	[PWG5100.9]	5.1.3
media-path-media-tray-full	[PWG5100.9]	5.1.3
media-path-media-tray-missing	[PWG5100.9]	5.1.3

output-mailbox-select-failure	[PWG5100.9]	5.1.3
power-down	[PWG5100.9]	5.1.3
power-up	[PWG5100.9]	5.1.3
printer-manual-reset	[PWG5100.9]	5.1.3
printer-nms-reset	[PWG5100.9]	5.1.3
printer-ready-to-print	[PWG5100.9]	5.1.3
subunit-added	[PWG5100.9]	5.1.3
subunit-almost-empty	[PWG5100.9]	5.1.3
subunit-almost-full	[PWG5100.9]	5.1.3
subunit-at-limit	[PWG5100.9]	5.1.3
subunit-closed	[PWG5100.9]	5.1.3
subunit-empty	[PWG5100.9]	5.1.3
subunit-full	[PWG5100.9]	5.1.3
subunit-life-almost-over	[PWG5100.9]	5.1.3
subunit-life-over	[PWG5100.9]	5.1.3
subunit-memory-exhausted	[PWG5100.9]	5.1.3
subunit-missing	[PWG5100.9]	5.1.3
subunit-motor-failure	[PWG5100.9]	5.1.3
subunit-near-limit	[PWG5100.9]	5.1.3
subunit-offline	[PWG5100.9]	5.1.3
subunit-opened	[PWG5100.9]	5.1.3
subunit-over-temperature	[PWG5100.9]	5.1.3
subunit-power-saver	[PWG5100.9]	5.1.3
subunit-recoverable-failure	[PWG5100.9]	5.1.3
subunit-recoverable-storage-error	[PWG5100.9]	5.1.3
subunit-removed	[PWG5100.9]	5.1.3
subunit-resource-added	[PWG5100.9]	5.1.3
subunit-resource-removed	[PWG5100.9]	5.1.3
subunit-thermistor-failure	[PWG5100.9]	5.1.3
subunit-timing-Failure	[PWG5100.9]	5.1.3
subunit-turned-off	[PWG5100.9]	5.1.3
subunit-turned-on	[PWG5100.9]	5.1.3
subunit-under-temperature	[PWG5100.9]	5.1.3
subunit-unrecoverable-failure	[PWG5100.9]	5.1.3
subunit-unrecoverable-storage-error	[PWG5100.9]	5.1.3
subunit-warming-up	[PWG5100.9]	5.1.3
unknown	[PWG5100.9]	5.1.3
bander-added	[PWG5100.9]	6.1.1
bander-almost-empty	[PWG5100.9]	6.1.1
bander-almost-full	[PWG5100.9]	6.1.1
bander-at-limit	[PWG5100.9]	6.1.1
bander-closed	[PWG5100.9]	6.1.1
bander-configuration-change	[PWG5100.9]	6.1.1
bander-cover-closed	[PWG5100.9]	6.1.1
bander-cover-open	[PWG5100.9]	6.1.1
bander-empty	[PWG5100.9]	6.1.1
bander-full	[PWG5100.9]	6.1.1
bander-interlock-closed	[PWG5100.9]	6.1.1
bander-interlock-open	[PWG5100.9]	6.1.1
bander-jam	[PWG5100.9]	6.1.1
bander-life-almost-over	[PWG5100.9]	6.1.1
bander-life-over	[PWG5100.9]	6.1.1
bander-memory-exhausted	[PWG5100.9]	6.1.1
bander-missing	[PWG5100.9]	6.1.1
bander-motor-failure	[PWG5100.9]	6.1.1
bander-near-limit	[PWG5100.9]	6.1.1
bander-offline	[PWG5100.9]	6.1.1

bander-opened	[PWG5100.9]	6.1.1
bander-over-temperature	[PWG5100.9]	6.1.1
bander-power-saver	[PWG5100.9]	6.1.1
bander-recoverable-failure	[PWG5100.9]	6.1.1
bander-recoverable-storage-error	[PWG5100.9]	6.1.1
bander-removed	[PWG5100.9]	6.1.1
bander-resource-added	[PWG5100.9]	6.1.1
bander-resource-removed	[PWG5100.9]	6.1.1
bander-thermistor-failure	[PWG5100.9]	6.1.1
bander-timing-failure	[PWG5100.9]	6.1.1
bander-turned-off	[PWG5100.9]	6.1.1
bander-turned-on	[PWG5100.9]	6.1.1
bander-under-temperature	[PWG5100.9]	6.1.1
bander-unrecoverable-failure	[PWG5100.9]	6.1.1
bander-unrecoverable-storage-error	[PWG5100.9]	6.1.1
bander-warming-up	[PWG5100.9]	6.1.1
binder-added	[PWG5100.9]	6.1.1
binder-almost-empty	[PWG5100.9]	6.1.1
binder-almost-full	[PWG5100.9]	6.1.1
binder-at-limit	[PWG5100.9]	6.1.1
binder-closed	[PWG5100.9]	6.1.1
binder-configuration-change	[PWG5100.9]	6.1.1
binder-cover-closed	[PWG5100.9]	6.1.1
binder-cover-open	[PWG5100.9]	6.1.1
binder-empty	[PWG5100.9]	6.1.1
binder-full	[PWG5100.9]	6.1.1
binder-interlock-closed	[PWG5100.9]	6.1.1
binder-interlock-open	[PWG5100.9]	6.1.1
binder-jam	[PWG5100.9]	6.1.1
binder-life-almost-over	[PWG5100.9]	6.1.1
binder-life-over	[PWG5100.9]	6.1.1
binder-memory-exhausted	[PWG5100.9]	6.1.1
binder-missing	[PWG5100.9]	6.1.1
binder-motor-failure	[PWG5100.9]	6.1.1
binder-near-limit	[PWG5100.9]	6.1.1
binder-offline	[PWG5100.9]	6.1.1
binder-opened	[PWG5100.9]	6.1.1
binder-over-temperature	[PWG5100.9]	6.1.1
binder-power-saver	[PWG5100.9]	6.1.1
binder-recoverable-failure	[PWG5100.9]	6.1.1
binder-recoverable-storage-error	[PWG5100.9]	6.1.1
binder-removed	[PWG5100.9]	6.1.1
binder-resource-added	[PWG5100.9]	6.1.1
binder-resource-removed	[PWG5100.9]	6.1.1
binder-thermistor-failure	[PWG5100.9]	6.1.1
binder-timing-failure	[PWG5100.9]	6.1.1
binder-turned-off	[PWG5100.9]	6.1.1
binder-turned-on	[PWG5100.9]	6.1.1
binder-under-temperature	[PWG5100.9]	6.1.1
binder-unrecoverable-failure	[PWG5100.9]	6.1.1
binder-unrecoverable-storage-error	[PWG5100.9]	6.1.1
binder-warming-up	[PWG5100.9]	6.1.1
die-cutter-added	[PWG5100.9]	6.1.1
die-cutter-almost-empty	[PWG5100.9]	6.1.1
die-cutter-almost-full	[PWG5100.9]	6.1.1
die-cutter-at-limit	[PWG5100.9]	6.1.1
die-cutter-closed	[PWG5100.9]	6.1.1

die-cutter-configuration-change	[PWG5100.9]	6.1.1
die-cutter-cover-closed	[PWG5100.9]	6.1.1
die-cutter-cover-open	[PWG5100.9]	6.1.1
die-cutter-empty	[PWG5100.9]	6.1.1
die-cutter-full	[PWG5100.9]	6.1.1
die-cutter-interlock-closed	[PWG5100.9]	6.1.1
die-cutter-interlock-open	[PWG5100.9]	6.1.1
die-cutter-jam	[PWG5100.9]	6.1.1
die-cutter-life-almost-over	[PWG5100.9]	6.1.1
die-cutter-life-over	[PWG5100.9]	6.1.1
die-cutter-memory-exhausted	[PWG5100.9]	6.1.1
die-cutter-missing	[PWG5100.9]	6.1.1
die-cutter-motor-failure	[PWG5100.9]	6.1.1
die-cutter-near-limit	[PWG5100.9]	6.1.1
die-cutter-offline	[PWG5100.9]	6.1.1
die-cutter-opened	[PWG5100.9]	6.1.1
die-cutter-over-temperature	[PWG5100.9]	6.1.1
die-cutter-power-saver	[PWG5100.9]	6.1.1
die-cutter-recoverable-failure	[PWG5100.9]	6.1.1
die-cutter-recoverable-storage-error	[PWG5100.9]	6.1.1
die-cutter-removed	[PWG5100.9]	6.1.1
die-cutter-resource-added	[PWG5100.9]	6.1.1
die-cutter-resource-removed	[PWG5100.9]	6.1.1
die-cutter-thermistor-failure	[PWG5100.9]	6.1.1
die-cutter-timing-failure	[PWG5100.9]	6.1.1
die-cutter-turned-off	[PWG5100.9]	6.1.1
die-cutter-turned-on	[PWG5100.9]	6.1.1
die-cutter-under-temperature	[PWG5100.9]	6.1.1
die-cutter-unrecoverable-failure	[PWG5100.9]	6.1.1
die-cutter-unrecoverable-storage-error	[PWG5100.9]	6.1.1
die-cutter-warming-up	[PWG5100.9]	6.1.1
folder-added	[PWG5100.9]	6.1.1
folder-almost-empty	[PWG5100.9]	6.1.1
folder-almost-full	[PWG5100.9]	6.1.1
folder-at-limit	[PWG5100.9]	6.1.1
folder-closed	[PWG5100.9]	6.1.1
folder-configuration-change	[PWG5100.9]	6.1.1
folder-cover-closed	[PWG5100.9]	6.1.1
folder-cover-open	[PWG5100.9]	6.1.1
folder-empty	[PWG5100.9]	6.1.1
folder-full	[PWG5100.9]	6.1.1
folder-interlock-closed	[PWG5100.9]	6.1.1
folder-interlock-open	[PWG5100.9]	6.1.1
folder-jam	[PWG5100.9]	6.1.1
folder-life-almost-over	[PWG5100.9]	6.1.1
folder-life-over	[PWG5100.9]	6.1.1
folder-memory-exhausted	[PWG5100.9]	6.1.1
folder-missing	[PWG5100.9]	6.1.1
folder-motor-failure	[PWG5100.9]	6.1.1
folder-near-limit	[PWG5100.9]	6.1.1
folder-offline	[PWG5100.9]	6.1.1
folder-opened	[PWG5100.9]	6.1.1
folder-over-temperature	[PWG5100.9]	6.1.1
folder-power-saver	[PWG5100.9]	6.1.1
folder-recoverable-failure	[PWG5100.9]	6.1.1
folder-recoverable-storage-error	[PWG5100.9]	6.1.1
folder-removed	[PWG5100.9]	6.1.1

folder-resource-added	[PWG5100.9]	6.1.1
folder-resource-removed	[PWG5100.9]	6.1.1
folder-thermistor-failure	[PWG5100.9]	6.1.1
folder-timing-failure	[PWG5100.9]	6.1.1
folder-turned-off	[PWG5100.9]	6.1.1
folder-turned-on	[PWG5100.9]	6.1.1
folder-under-temperature	[PWG5100.9]	6.1.1
folder-unrecoverable-failure	[PWG5100.9]	6.1.1
folder-unrecoverable-storage-error	[PWG5100.9]	6.1.1
folder-warming-up	[PWG5100.9]	6.1.1
imprinter-added	[PWG5100.9]	6.1.1
imprinter-almost-empty	[PWG5100.9]	6.1.1
imprinter-almost-full	[PWG5100.9]	6.1.1
imprinter-at-limit	[PWG5100.9]	6.1.1
imprinter-closed	[PWG5100.9]	6.1.1
imprinter-configuration-change	[PWG5100.9]	6.1.1
imprinter-cover-closed	[PWG5100.9]	6.1.1
imprinter-cover-open	[PWG5100.9]	6.1.1
imprinter-empty	[PWG5100.9]	6.1.1
imprinter-full	[PWG5100.9]	6.1.1
imprinter-interlock-closed	[PWG5100.9]	6.1.1
imprinter-interlock-open	[PWG5100.9]	6.1.1
imprinter-jam	[PWG5100.9]	6.1.1
imprinter-life-almost-over	[PWG5100.9]	6.1.1
imprinter-life-over	[PWG5100.9]	6.1.1
imprinter-memory-exhausted	[PWG5100.9]	6.1.1
imprinter-missing	[PWG5100.9]	6.1.1
imprinter-motor-failure	[PWG5100.9]	6.1.1
imprinter-near-limit	[PWG5100.9]	6.1.1
imprinter-offline	[PWG5100.9]	6.1.1
imprinter-opened	[PWG5100.9]	6.1.1
imprinter-over-temperature	[PWG5100.9]	6.1.1
imprinter-power-saver	[PWG5100.9]	6.1.1
imprinter-recoverable-failure	[PWG5100.9]	6.1.1
imprinter-recoverable-storage-error	[PWG5100.9]	6.1.1
imprinter-removed	[PWG5100.9]	6.1.1
imprinter-resource-added	[PWG5100.9]	6.1.1
imprinter-resource-removed	[PWG5100.9]	6.1.1
imprinter-thermistor-failure	[PWG5100.9]	6.1.1
imprinter-timing-failure	[PWG5100.9]	6.1.1
imprinter-turned-off	[PWG5100.9]	6.1.1
imprinter-turned-on	[PWG5100.9]	6.1.1
imprinter-under-temperature	[PWG5100.9]	6.1.1
imprinter-unrecoverable-failure	[PWG5100.9]	6.1.1
imprinter-unrecoverable-storage-error	[PWG5100.9]	6.1.1
imprinter-warming-up	[PWG5100.9]	6.1.1
insertter-added	[PWG5100.9]	6.1.1
insertter-almost-empty	[PWG5100.9]	6.1.1
insertter-almost-full	[PWG5100.9]	6.1.1
insertter-at-limit	[PWG5100.9]	6.1.1
insertter-closed	[PWG5100.9]	6.1.1
insertter-configuration-change	[PWG5100.9]	6.1.1
insertter-cover-closed	[PWG5100.9]	6.1.1
insertter-cover-open	[PWG5100.9]	6.1.1
insertter-empty	[PWG5100.9]	6.1.1
insertter-full	[PWG5100.9]	6.1.1
insertter-interlock-closed	[PWG5100.9]	6.1.1

insert-er-interlock-open	[PWG5100.9]	6.1.1
insert-er-jam	[PWG5100.9]	6.1.1
insert-er-life-almost-over	[PWG5100.9]	6.1.1
insert-er-life-over	[PWG5100.9]	6.1.1
insert-er-memory-exhausted	[PWG5100.9]	6.1.1
insert-er-missing	[PWG5100.9]	6.1.1
insert-er-motor-failure	[PWG5100.9]	6.1.1
insert-er-near-limit	[PWG5100.9]	6.1.1
insert-er-offline	[PWG5100.9]	6.1.1
insert-er-opened	[PWG5100.9]	6.1.1
insert-er-over-temperature	[PWG5100.9]	6.1.1
insert-er-power-saver	[PWG5100.9]	6.1.1
insert-er-recoverable-failure	[PWG5100.9]	6.1.1
insert-er-recoverable-storage-error	[PWG5100.9]	6.1.1
insert-er-removed	[PWG5100.9]	6.1.1
insert-er-resource-added	[PWG5100.9]	6.1.1
insert-er-resource-removed	[PWG5100.9]	6.1.1
insert-er-thermistor-failure	[PWG5100.9]	6.1.1
insert-er-timing-failure	[PWG5100.9]	6.1.1
insert-er-turned-off	[PWG5100.9]	6.1.1
insert-er-turned-on	[PWG5100.9]	6.1.1
insert-er-under-temperature	[PWG5100.9]	6.1.1
insert-er-unrecoverable-failure	[PWG5100.9]	6.1.1
insert-er-unrecoverable-storage-error	[PWG5100.9]	6.1.1
insert-er-warming-up	[PWG5100.9]	6.1.1
make-envelope-added	[PWG5100.9]	6.1.1
make-envelope-almost-empty	[PWG5100.9]	6.1.1
make-envelope-almost-full	[PWG5100.9]	6.1.1
make-envelope-at-limit	[PWG5100.9]	6.1.1
make-envelope-closed	[PWG5100.9]	6.1.1
make-envelope-configuration-change	[PWG5100.9]	6.1.1
make-envelope-cover-closed	[PWG5100.9]	6.1.1
make-envelope-cover-open	[PWG5100.9]	6.1.1
make-envelope-empty	[PWG5100.9]	6.1.1
make-envelope-full	[PWG5100.9]	6.1.1
make-envelope-interlock-closed	[PWG5100.9]	6.1.1
make-envelope-interlock-open	[PWG5100.9]	6.1.1
make-envelope-jam	[PWG5100.9]	6.1.1
make-envelope-life-almost-over	[PWG5100.9]	6.1.1
make-envelope-life-over	[PWG5100.9]	6.1.1
make-envelope-memory-exhausted	[PWG5100.9]	6.1.1
make-envelope-missing	[PWG5100.9]	6.1.1
make-envelope-motor-failure	[PWG5100.9]	6.1.1
make-envelope-near-limit	[PWG5100.9]	6.1.1
make-envelope-offline	[PWG5100.9]	6.1.1
make-envelope-opened	[PWG5100.9]	6.1.1
make-envelope-over-temperature	[PWG5100.9]	6.1.1
make-envelope-power-saver	[PWG5100.9]	6.1.1
make-envelope-recoverable-failure	[PWG5100.9]	6.1.1
make-envelope-recoverable-storage-error	[PWG5100.9]	6.1.1
make-envelope-removed	[PWG5100.9]	6.1.1
make-envelope-resource-added	[PWG5100.9]	6.1.1
make-envelope-resource-removed	[PWG5100.9]	6.1.1
make-envelope-thermistor-failure	[PWG5100.9]	6.1.1
make-envelope-timing-failure	[PWG5100.9]	6.1.1
make-envelope-turned-off	[PWG5100.9]	6.1.1
make-envelope-turned-on	[PWG5100.9]	6.1.1

make-envelope-under-temperature	[PWG5100.9]	6.1.1
make-envelope-unrecoverable-failure	[PWG5100.9]	6.1.1
make-envelope-unrecoverable-storage-error	[PWG5100.9]	6.1.1
make-envelope-warming-up	[PWG5100.9]	6.1.1
perforater-added	[PWG5100.9]	6.1.1
perforater-almost-empty	[PWG5100.9]	6.1.1
perforater-almost-full	[PWG5100.9]	6.1.1
perforater-at-limit	[PWG5100.9]	6.1.1
perforater-closed	[PWG5100.9]	6.1.1
perforater-configuration-change	[PWG5100.9]	6.1.1
perforater-cover-closed	[PWG5100.9]	6.1.1
perforater-cover-open	[PWG5100.9]	6.1.1
perforater-empty	[PWG5100.9]	6.1.1
perforater-full	[PWG5100.9]	6.1.1
perforater-interlock-closed	[PWG5100.9]	6.1.1
perforater-interlock-open	[PWG5100.9]	6.1.1
perforater-jam	[PWG5100.9]	6.1.1
perforater-life-almost-over	[PWG5100.9]	6.1.1
perforater-life-over	[PWG5100.9]	6.1.1
perforater-memory-exhausted	[PWG5100.9]	6.1.1
perforater-missing	[PWG5100.9]	6.1.1
perforater-motor-failure	[PWG5100.9]	6.1.1
perforater-near-limit	[PWG5100.9]	6.1.1
perforater-offline	[PWG5100.9]	6.1.1
perforater-opened	[PWG5100.9]	6.1.1
perforater-over-temperature	[PWG5100.9]	6.1.1
perforater-power-saver	[PWG5100.9]	6.1.1
perforater-recoverable-failure	[PWG5100.9]	6.1.1
perforater-recoverable-storage-error	[PWG5100.9]	6.1.1
perforater-removed	[PWG5100.9]	6.1.1
perforater-resource-added	[PWG5100.9]	6.1.1
perforater-resource-removed	[PWG5100.9]	6.1.1
perforater-thermistor-failure	[PWG5100.9]	6.1.1
perforater-timing-failure	[PWG5100.9]	6.1.1
perforater-turned-off	[PWG5100.9]	6.1.1
perforater-turned-on	[PWG5100.9]	6.1.1
perforater-under-temperature	[PWG5100.9]	6.1.1
perforater-unrecoverable-failure	[PWG5100.9]	6.1.1
perforater-unrecoverable-storage-error	[PWG5100.9]	6.1.1
perforater-warming-up	[PWG5100.9]	6.1.1
puncher-added	[PWG5100.9]	6.1.1
puncher-almost-empty	[PWG5100.9]	6.1.1
puncher-almost-full	[PWG5100.9]	6.1.1
puncher-at-limit	[PWG5100.9]	6.1.1
puncher-closed	[PWG5100.9]	6.1.1
puncher-configuration-change	[PWG5100.9]	6.1.1
puncher-cover-closed	[PWG5100.9]	6.1.1
puncher-cover-open	[PWG5100.9]	6.1.1
puncher-empty	[PWG5100.9]	6.1.1
puncher-full	[PWG5100.9]	6.1.1
puncher-interlock-closed	[PWG5100.9]	6.1.1
puncher-interlock-open	[PWG5100.9]	6.1.1
puncher-jam	[PWG5100.9]	6.1.1
puncher-life-almost-over	[PWG5100.9]	6.1.1
puncher-life-over	[PWG5100.9]	6.1.1
puncher-memory-exhausted	[PWG5100.9]	6.1.1
puncher-missing	[PWG5100.9]	6.1.1

puncher-motor-failure	[PWG5100.9]	6.1.1
puncher-near-limit	[PWG5100.9]	6.1.1
puncher-offline	[PWG5100.9]	6.1.1
puncher-opened	[PWG5100.9]	6.1.1
puncher-over-temperature	[PWG5100.9]	6.1.1
puncher-power-saver	[PWG5100.9]	6.1.1
puncher-recoverable-failure	[PWG5100.9]	6.1.1
puncher-recoverable-storage-error	[PWG5100.9]	6.1.1
puncher-removed	[PWG5100.9]	6.1.1
puncher-resource-added	[PWG5100.9]	6.1.1
puncher-resource-removed	[PWG5100.9]	6.1.1
puncher-thermistor-failure	[PWG5100.9]	6.1.1
puncher-timing-failure	[PWG5100.9]	6.1.1
puncher-turned-off	[PWG5100.9]	6.1.1
puncher-turned-on	[PWG5100.9]	6.1.1
puncher-under-temperature	[PWG5100.9]	6.1.1
puncher-unrecoverable-failure	[PWG5100.9]	6.1.1
puncher-unrecoverable-storage-error	[PWG5100.9]	6.1.1
puncher-warming-up	[PWG5100.9]	6.1.1
separation-cutter-added	[PWG5100.9]	6.1.1
separation-cutter-almost-empty	[PWG5100.9]	6.1.1
separation-cutter-almost-full	[PWG5100.9]	6.1.1
separation-cutter-at-limit	[PWG5100.9]	6.1.1
separation-cutter-closed	[PWG5100.9]	6.1.1
separation-cutter-configuration-change	[PWG5100.9]	6.1.1
separation-cutter-cover-closed	[PWG5100.9]	6.1.1
separation-cutter-cover-open	[PWG5100.9]	6.1.1
separation-cutter-empty	[PWG5100.9]	6.1.1
separation-cutter-full	[PWG5100.9]	6.1.1
separation-cutter-interlock-closed	[PWG5100.9]	6.1.1
separation-cutter-interlock-open	[PWG5100.9]	6.1.1
separation-cutter-jam	[PWG5100.9]	6.1.1
separation-cutter-life-almost-over	[PWG5100.9]	6.1.1
separation-cutter-life-over	[PWG5100.9]	6.1.1
separation-cutter-memory-exhausted	[PWG5100.9]	6.1.1
separation-cutter-missing	[PWG5100.9]	6.1.1
separation-cutter-motor-failure	[PWG5100.9]	6.1.1
separation-cutter-near-limit	[PWG5100.9]	6.1.1
separation-cutter-offline	[PWG5100.9]	6.1.1
separation-cutter-opened	[PWG5100.9]	6.1.1
separation-cutter-over-temperature	[PWG5100.9]	6.1.1
separation-cutter-power-saver	[PWG5100.9]	6.1.1
separation-cutter-recoverable-failure	[PWG5100.9]	6.1.1
separation-cutter-recoverable-storage-error	[PWG5100.9]	6.1.1
separation-cutter-removed	[PWG5100.9]	6.1.1
separation-cutter-resource-added	[PWG5100.9]	6.1.1
separation-cutter-resource-removed	[PWG5100.9]	6.1.1
separation-cutter-thermistor-failure	[PWG5100.9]	6.1.1
separation-cutter-timing-failure	[PWG5100.9]	6.1.1
separation-cutter-turned-off	[PWG5100.9]	6.1.1
separation-cutter-turned-on	[PWG5100.9]	6.1.1
separation-cutter-under-temperature	[PWG5100.9]	6.1.1
separation-cutter-unrecoverable-failure	[PWG5100.9]	6.1.1
separation-cutter-unrecoverable-storage-error	[PWG5100.9]	6.1.1
separation-cutter-warming-up	[PWG5100.9]	6.1.1
sheet-rotator-added	[PWG5100.9]	6.1.1
sheet-rotator-almost-empty	[PWG5100.9]	6.1.1

sheet-rotator-almost-full	[PWG5100.9]	6.1.1
sheet-rotator-at-limit	[PWG5100.9]	6.1.1
sheet-rotator-closed	[PWG5100.9]	6.1.1
sheet-rotator-configuration-change	[PWG5100.9]	6.1.1
sheet-rotator-cover-closed	[PWG5100.9]	6.1.1
sheet-rotator-cover-open	[PWG5100.9]	6.1.1
sheet-rotator-empty	[PWG5100.9]	6.1.1
sheet-rotator-full	[PWG5100.9]	6.1.1
sheet-rotator-interlock-closed	[PWG5100.9]	6.1.1
sheet-rotator-interlock-open	[PWG5100.9]	6.1.1
sheet-rotator-jam	[PWG5100.9]	6.1.1
sheet-rotator-life-almost-over	[PWG5100.9]	6.1.1
sheet-rotator-life-over	[PWG5100.9]	6.1.1
sheet-rotator-memory-exhausted	[PWG5100.9]	6.1.1
sheet-rotator-missing	[PWG5100.9]	6.1.1
sheet-rotator-motor-failure	[PWG5100.9]	6.1.1
sheet-rotator-near-limit	[PWG5100.9]	6.1.1
sheet-rotator-offline	[PWG5100.9]	6.1.1
sheet-rotator-opened	[PWG5100.9]	6.1.1
sheet-rotator-over-temperature	[PWG5100.9]	6.1.1
sheet-rotator-power-saver	[PWG5100.9]	6.1.1
sheet-rotator-recoverable-failure	[PWG5100.9]	6.1.1
sheet-rotator-recoverable-storage-error	[PWG5100.9]	6.1.1
sheet-rotator-removed	[PWG5100.9]	6.1.1
sheet-rotator-resource-added	[PWG5100.9]	6.1.1
sheet-rotator-resource-removed	[PWG5100.9]	6.1.1
sheet-rotator-thermistor-failure	[PWG5100.9]	6.1.1
sheet-rotator-timing-failure	[PWG5100.9]	6.1.1
sheet-rotator-turned-off	[PWG5100.9]	6.1.1
sheet-rotator-turned-on	[PWG5100.9]	6.1.1
sheet-rotator-under-temperature	[PWG5100.9]	6.1.1
sheet-rotator-unrecoverable-failure	[PWG5100.9]	6.1.1
sheet-rotator-unrecoverable-storage-error	[PWG5100.9]	6.1.1
sheet-rotator-warming-up	[PWG5100.9]	6.1.1
slitter-added	[PWG5100.9]	6.1.1
slitter-almost-empty	[PWG5100.9]	6.1.1
slitter-almost-full	[PWG5100.9]	6.1.1
slitter-at-limit	[PWG5100.9]	6.1.1
slitter-closed	[PWG5100.9]	6.1.1
slitter-configuration-change	[PWG5100.9]	6.1.1
slitter-cover-closed	[PWG5100.9]	6.1.1
slitter-cover-open	[PWG5100.9]	6.1.1
slitter-empty	[PWG5100.9]	6.1.1
slitter-full	[PWG5100.9]	6.1.1
slitter-interlock-closed	[PWG5100.9]	6.1.1
slitter-interlock-open	[PWG5100.9]	6.1.1
slitter-jam	[PWG5100.9]	6.1.1
slitter-life-almost-over	[PWG5100.9]	6.1.1
slitter-life-over	[PWG5100.9]	6.1.1
slitter-memory-exhausted	[PWG5100.9]	6.1.1
slitter-missing	[PWG5100.9]	6.1.1
slitter-motor-failure	[PWG5100.9]	6.1.1
slitter-near-limit	[PWG5100.9]	6.1.1
slitter-offline	[PWG5100.9]	6.1.1
slitter-opened	[PWG5100.9]	6.1.1
slitter-over-temperature	[PWG5100.9]	6.1.1
slitter-power-saver	[PWG5100.9]	6.1.1

slitter-recoverable-failure	[PWG5100.9]	6.1.1
slitter-recoverable-storage-error	[PWG5100.9]	6.1.1
slitter-removed	[PWG5100.9]	6.1.1
slitter-resource-added	[PWG5100.9]	6.1.1
slitter-resource-removed	[PWG5100.9]	6.1.1
slitter-thermistor-failure	[PWG5100.9]	6.1.1
slitter-timing-failure	[PWG5100.9]	6.1.1
slitter-turned-off	[PWG5100.9]	6.1.1
slitter-turned-on	[PWG5100.9]	6.1.1
slitter-under-temperature	[PWG5100.9]	6.1.1
slitter-unrecoverable-failure	[PWG5100.9]	6.1.1
slitter-unrecoverable-storage-error	[PWG5100.9]	6.1.1
slitter-warming-up	[PWG5100.9]	6.1.1
stacker-added	[PWG5100.9]	6.1.1
stacker-almost-empty	[PWG5100.9]	6.1.1
stacker-almost-full	[PWG5100.9]	6.1.1
stacker-at-limit	[PWG5100.9]	6.1.1
stacker-closed	[PWG5100.9]	6.1.1
stacker-configuration-change	[PWG5100.9]	6.1.1
stacker-cover-closed	[PWG5100.9]	6.1.1
stacker-cover-open	[PWG5100.9]	6.1.1
stacker-empty	[PWG5100.9]	6.1.1
stacker-full	[PWG5100.9]	6.1.1
stacker-interlock-closed	[PWG5100.9]	6.1.1
stacker-interlock-open	[PWG5100.9]	6.1.1
stacker-jam	[PWG5100.9]	6.1.1
stacker-life-almost-over	[PWG5100.9]	6.1.1
stacker-life-over	[PWG5100.9]	6.1.1
stacker-memory-exhausted	[PWG5100.9]	6.1.1
stacker-missing	[PWG5100.9]	6.1.1
stacker-motor-failure	[PWG5100.9]	6.1.1
stacker-near-limit	[PWG5100.9]	6.1.1
stacker-offline	[PWG5100.9]	6.1.1
stacker-opened	[PWG5100.9]	6.1.1
stacker-over-temperature	[PWG5100.9]	6.1.1
stacker-power-saver	[PWG5100.9]	6.1.1
stacker-recoverable-failure	[PWG5100.9]	6.1.1
stacker-recoverable-storage-error	[PWG5100.9]	6.1.1
stacker-removed	[PWG5100.9]	6.1.1
stacker-resource-added	[PWG5100.9]	6.1.1
stacker-resource-removed	[PWG5100.9]	6.1.1
stacker-thermistor-failure	[PWG5100.9]	6.1.1
stacker-timing-failure	[PWG5100.9]	6.1.1
stacker-turned-off	[PWG5100.9]	6.1.1
stacker-turned-on	[PWG5100.9]	6.1.1
stacker-under-temperature	[PWG5100.9]	6.1.1
stacker-unrecoverable-failure	[PWG5100.9]	6.1.1
stacker-unrecoverable-storage-error	[PWG5100.9]	6.1.1
stacker-warming-up	[PWG5100.9]	6.1.1
stapler-added	[PWG5100.9]	6.1.1
stapler-almost-empty	[PWG5100.9]	6.1.1
stapler-almost-full	[PWG5100.9]	6.1.1
stapler-at-limit	[PWG5100.9]	6.1.1
stapler-closed	[PWG5100.9]	6.1.1
stapler-configuration-change	[PWG5100.9]	6.1.1
stapler-cover-closed	[PWG5100.9]	6.1.1
stapler-cover-open	[PWG5100.9]	6.1.1

stapler-empty	[PWG5100.9]	6.1.1
stapler-full	[PWG5100.9]	6.1.1
stapler-interlock-closed	[PWG5100.9]	6.1.1
stapler-interlock-open	[PWG5100.9]	6.1.1
stapler-jam	[PWG5100.9]	6.1.1
stapler-life-almost-over	[PWG5100.9]	6.1.1
stapler-life-over	[PWG5100.9]	6.1.1
stapler-memory-exhausted	[PWG5100.9]	6.1.1
stapler-missing	[PWG5100.9]	6.1.1
stapler-motor-failure	[PWG5100.9]	6.1.1
stapler-near-limit	[PWG5100.9]	6.1.1
stapler-offline	[PWG5100.9]	6.1.1
stapler-opened	[PWG5100.9]	6.1.1
stapler-over-temperature	[PWG5100.9]	6.1.1
stapler-power-saver	[PWG5100.9]	6.1.1
stapler-recoverable-failure	[PWG5100.9]	6.1.1
stapler-recoverable-storage-error	[PWG5100.9]	6.1.1
stapler-removed	[PWG5100.9]	6.1.1
stapler-resource-added	[PWG5100.9]	6.1.1
stapler-resource-removed	[PWG5100.9]	6.1.1
stapler-thermistor-failure	[PWG5100.9]	6.1.1
stapler-timing-failure	[PWG5100.9]	6.1.1
stapler-turned-off	[PWG5100.9]	6.1.1
stapler-turned-on	[PWG5100.9]	6.1.1
stapler-under-temperature	[PWG5100.9]	6.1.1
stapler-unrecoverable-failure	[PWG5100.9]	6.1.1
stapler-unrecoverable-storage-error	[PWG5100.9]	6.1.1
stapler-warming-up	[PWG5100.9]	6.1.1
stitcher-added	[PWG5100.9]	6.1.1
stitcher-almost-empty	[PWG5100.9]	6.1.1
stitcher-almost-full	[PWG5100.9]	6.1.1
stitcher-at-limit	[PWG5100.9]	6.1.1
stitcher-closed	[PWG5100.9]	6.1.1
stitcher-configuration-change	[PWG5100.9]	6.1.1
stitcher-cover-closed	[PWG5100.9]	6.1.1
stitcher-cover-open	[PWG5100.9]	6.1.1
stitcher-empty	[PWG5100.9]	6.1.1
stitcher-full	[PWG5100.9]	6.1.1
stitcher-interlock-closed	[PWG5100.9]	6.1.1
stitcher-interlock-open	[PWG5100.9]	6.1.1
stitcher-jam	[PWG5100.9]	6.1.1
stitcher-life-almost-over	[PWG5100.9]	6.1.1
stitcher-life-over	[PWG5100.9]	6.1.1
stitcher-memory-exhausted	[PWG5100.9]	6.1.1
stitcher-missing	[PWG5100.9]	6.1.1
stitcher-motor-failure	[PWG5100.9]	6.1.1
stitcher-near-limit	[PWG5100.9]	6.1.1
stitcher-offline	[PWG5100.9]	6.1.1
stitcher-opened	[PWG5100.9]	6.1.1
stitcher-over-temperature	[PWG5100.9]	6.1.1
stitcher-power-saver	[PWG5100.9]	6.1.1
stitcher-recoverable-failure	[PWG5100.9]	6.1.1
stitcher-recoverable-storage-error	[PWG5100.9]	6.1.1
stitcher-removed	[PWG5100.9]	6.1.1
stitcher-resource-added	[PWG5100.9]	6.1.1
stitcher-resource-removed	[PWG5100.9]	6.1.1
stitcher-thermistor-failure	[PWG5100.9]	6.1.1

stitcher-timing-failure	[PWG5100.9]	6.1.1
stitcher-turned-off	[PWG5100.9]	6.1.1
stitcher-turned-on	[PWG5100.9]	6.1.1
stitcher-under-temperature	[PWG5100.9]	6.1.1
stitcher-unrecoverable-failure	[PWG5100.9]	6.1.1
stitcher-unrecoverable-storage-error	[PWG5100.9]	6.1.1
stitcher-warming-up	[PWG5100.9]	6.1.1
trimmer-added	[PWG5100.9]	6.1.1
trimmer-almost-empty	[PWG5100.9]	6.1.1
trimmer-almost-full	[PWG5100.9]	6.1.1
trimmer-at-limit	[PWG5100.9]	6.1.1
trimmer-closed	[PWG5100.9]	6.1.1
trimmer-configuration-change	[PWG5100.9]	6.1.1
trimmer-cover-closed	[PWG5100.9]	6.1.1
trimmer-cover-open	[PWG5100.9]	6.1.1
trimmer-empty	[PWG5100.9]	6.1.1
trimmer-full	[PWG5100.9]	6.1.1
trimmer-interlock-closed	[PWG5100.9]	6.1.1
trimmer-interlock-open	[PWG5100.9]	6.1.1
trimmer-jam	[PWG5100.9]	6.1.1
trimmer-life-almost-over	[PWG5100.9]	6.1.1
trimmer-life-over	[PWG5100.9]	6.1.1
trimmer-memory-exhausted	[PWG5100.9]	6.1.1
trimmer-missing	[PWG5100.9]	6.1.1
trimmer-motor-failure	[PWG5100.9]	6.1.1
trimmer-near-limit	[PWG5100.9]	6.1.1
trimmer-offline	[PWG5100.9]	6.1.1
trimmer-opened	[PWG5100.9]	6.1.1
trimmer-over-temperature	[PWG5100.9]	6.1.1
trimmer-power-saver	[PWG5100.9]	6.1.1
trimmer-recoverable-failure	[PWG5100.9]	6.1.1
trimmer-recoverable-storage-error	[PWG5100.9]	6.1.1
trimmer-removed	[PWG5100.9]	6.1.1
trimmer-resource-added	[PWG5100.9]	6.1.1
trimmer-resource-removed	[PWG5100.9]	6.1.1
trimmer-thermistor-failure	[PWG5100.9]	6.1.1
trimmer-timing-failure	[PWG5100.9]	6.1.1
trimmer-turned-off	[PWG5100.9]	6.1.1
trimmer-turned-on	[PWG5100.9]	6.1.1
trimmer-under-temperature	[PWG5100.9]	6.1.1
trimmer-unrecoverable-failure	[PWG5100.9]	6.1.1
trimmer-unrecoverable-storage-error	[PWG5100.9]	6.1.1
trimmer-warming-up	[PWG5100.9]	6.1.1
wrapper-added	[PWG5100.9]	6.1.1
wrapper-almost-empty	[PWG5100.9]	6.1.1
wrapper-almost-full	[PWG5100.9]	6.1.1
wrapper-at-limit	[PWG5100.9]	6.1.1
wrapper-closed	[PWG5100.9]	6.1.1
wrapper-configuration-change	[PWG5100.9]	6.1.1
wrapper-cover-closed	[PWG5100.9]	6.1.1
wrapper-cover-open	[PWG5100.9]	6.1.1
wrapper-empty	[PWG5100.9]	6.1.1
wrapper-full	[PWG5100.9]	6.1.1
wrapper-interlock-closed	[PWG5100.9]	6.1.1
wrapper-interlock-open	[PWG5100.9]	6.1.1
wrapper-jam	[PWG5100.9]	6.1.1
wrapper-life-almost-over	[PWG5100.9]	6.1.1

wrapper-life-over	[PWG5100.9]	6.1.1
wrapper-memory-exhausted	[PWG5100.9]	6.1.1
wrapper-missing	[PWG5100.9]	6.1.1
wrapper-motor-failure	[PWG5100.9]	6.1.1
wrapper-near-limit	[PWG5100.9]	6.1.1
wrapper-offline	[PWG5100.9]	6.1.1
wrapper-opened	[PWG5100.9]	6.1.1
wrapper-over-temperature	[PWG5100.9]	6.1.1
wrapper-power-saver	[PWG5100.9]	6.1.1
wrapper-recoverable-failure	[PWG5100.9]	6.1.1
wrapper-recoverable-storage-error	[PWG5100.9]	6.1.1
wrapper-removed	[PWG5100.9]	6.1.1
wrapper-resource-added	[PWG5100.9]	6.1.1
wrapper-resource-removed	[PWG5100.9]	6.1.1
wrapper-thermistor-failure	[PWG5100.9]	6.1.1
wrapper-timing-failure	[PWG5100.9]	6.1.1
wrapper-turned-off	[PWG5100.9]	6.1.1
wrapper-turned-on	[PWG5100.9]	6.1.1
wrapper-under-temperature	[PWG5100.9]	6.1.1
wrapper-unrecoverable-failure	[PWG5100.9]	6.1.1
wrapper-unrecoverable-storage-error	[PWG5100.9]	6.1.1
wrapper-warming-up	[PWG5100.9]	6.1.1

8.2 IANA Printer MIB Alert Values Registrations

This section contains the updates for IANA to add to the IANA Printer MIB according to the procedures defined in section 7 of [RFC3805] to cover the definitions in this document. The resulting registrations will be published in:

<http://www.iana.org/assignments/ianaprinter-mib>

IANA should first remove the comma on the last enumerated value in the 'PrtAlertCodeTC' textual convention and then insert the following new enumerated values and ASN.1 comments on usage:

Table 8-2 - IANA Printer MIB Alert Values for IANA

```
-- FinDeviceTypeTC = sticher(3) -> stapler
-- FinStitchingTypeTC = staple... (4,5,6,7, or 10)
staplerCoverOpen(30203),
staplerCoverClosed(30204),
staplerInterlockOpen(30205),
staplerInterlockClosed(30206),
staplerConfigurationChange(30207),
staplerJam(30208),
staplerMissing(30209),
staplerLifeAlmostOver(30210),
staplerLifeOver(30211),
staplerAlmostEmpty(30212),
staplerEmpty(30213),
staplerAlmostFull(30214),
staplerFull(30215),
staplerNearLimit(30216),
staplerAtLimit(30217),
staplerOpened(30218),
staplerClosed(30219),
staplerTurnedOn(30220),
staplerTurnedOff(30221),
staplerOffline(30222),
staplerPowerSaver(30223),
staplerWarmingUp(30224),
staplerAdded(30225),
staplerRemoved(30226),
staplerResourceAdded(30227),
staplerResourceRemoved(30228),
staplerRecoverableFailure(30229),
staplerUnrecoverableFailure(30230),
staplerRecoverableStorageError(30231),
staplerUnrecoverableStorageError(30232),
staplerMotorFailure(30233),
staplerMemoryExhausted(30234),
staplerUnderTemperature(30235),
staplerOverTemperature(30236),
staplerTimingFailure(30237),
staplerThermistorFailure(30238),

-- FinDeviceTypeTC = sticher(3) -> sticher
-- FinStitchingTypeTC = saddleStitch(8) or edgeStitch(9)
```



```
stitcherCoverOpen(30303),
stitcherCoverClosed(30304),
stitcherInterlockOpen(30305),
stitcherInterlockClosed(30306),
stitcherConfigurationChange(30307),
stitcherJam(30308),
stitcherMissing(30309),
stitcherLifeAlmostOver(30310),
stitcherLifeOver(30311),
stitcherAlmostEmpty(30312),
stitcherEmpty(30313),
stitcherAlmostFull(30314),
stitcherFull(30315),
stitcherNearLimit(30316),
stitcherAtLimit(30317),
stitcherOpened(30318),
stitcherClosed(30319),
stitcherTurnedOn(30320),
stitcherTurnedOff(30321),
stitcherOffline(30322),
stitcherPowerSaver(30323),
stitcherWarmingUp(30324),
stitcherAdded(30325),
stitcherRemoved(30326),
stitcherResourceAdded(30327),
stitcherResourceRemoved(30328),
stitcherRecoverableFailure(30329),
stitcherUnrecoverableFailure(30330),
stitcherRecoverableStorageError(30331),
stitcherUnrecoverableStorageError(30332),
stitcherMotorFailure(30333),
stitcherMemoryExhausted(30334),
stitcherUnderTemperature(30335),
stitcherOverTemperature(30336),
stitcherTimingFailure(30337),
stitcherThermistorFailure(30338),
```

```
-- FinDeviceTypeTC = folder(4)
folderCoverOpen(30403),
folderCoverClosed(30404),
folderInterlockOpen(30405),
folderInterlockClosed(30406),
folderConfigurationChange(30407),
folderJam(30408),
folderMissing(30409),
folderLifeAlmostOver(30410),
folderLifeOver(30411),
folderAlmostEmpty(30412),
folderEmpty(30413),
folderAlmostFull(30414),
folderFull(30415),
folderNearLimit(30416),
folderAtLimit(30417),
folderOpened(30418),
folderClosed(30419),
folderTurnedOn(30420),
folderTurnedOff(30421),
```

```
folderOffline(30422),
folderPowerSaver(30423),
folderWarmingUp(30424),
folderAdded(30425),
folderRemoved(30426),
folderResourceAdded(30427),
folderResourceRemoved(30428),
folderRecoverableFailure(30429),
folderUnrecoverableFailure(30430),
folderRecoverableStorageError(30431),
folderUnrecoverableStorageError(30432),
folderMotorFailure(30433),
folderMemoryExhausted(30434),
folderUnderTemperature(30435),
folderOverTemperature(30436),
folderTimingFailure(30437),
folderThermistorFailure(30438),

-- FinDeviceTypeTC = binder(5)
binderCoverOpen(30503),
binderCoverClosed(30504),
binderInterlockOpen(30505),
binderInterlockClosed(30506),
binderConfigurationChange(30507),
binderJam(30508),
binderMissing(30509),
binderLifeAlmostOver(30510),
binderLifeOver(30511),
binderAlmostEmpty(30512),
binderEmpty(30513),
binderAlmostFull(30514),
binderFull(30515),
binderNearLimit(30516),
binderAtLimit(30517),
binderOpened(30518),
binderClosed(30519),
binderTurnedOn(30520),
binderTurnedOff(30521),
binderOffline(30522),
binderPowerSaver(30523),
binderWarmingUp(30524),
binderAdded(30525),
binderRemoved(30526),
binderResourceAdded(30527),
binderResourceRemoved(30528),
binderRecoverableFailure(30529),
binderUnrecoverableFailure(30530),
binderRecoverableStorageError(30531),
binderUnrecoverableStorageError(30532),
binderMotorFailure(30533),
binderMemoryExhausted(30534),
binderUnderTemperature(30535),
binderOverTemperature(30536),
binderTimingFailure(30537),
binderThermistorFailure(30538),

-- FinDeviceTypeTC = trimmer(6)
```

```
trimmerCoverOpen(30603),
trimmerCoverClosed(30604),
trimmerInterlockOpen(30605),
trimmerInterlockClosed(30606),
trimmerConfigurationChange(30607),
trimmerJam(30608),
trimmerMissing(30609),
trimmerLifeAlmostOver(30610),
trimmerLifeOver(30611),
trimmerAlmostEmpty(30612),
trimmerEmpty(30613),
trimmerAlmostFull(30614),
trimmerFull(30615),
trimmerNearLimit(30616),
trimmerAtLimit(30617),
trimmerOpened(30618),
trimmerClosed(30619),
trimmerTurnedOn(30620),
trimmerTurnedOff(30621),
trimmerOffline(30622),
trimmerPowerSaver(30623),
trimmerWarmingUp(30624),
trimmerAdded(30625),
trimmerRemoved(30626),
trimmerResourceAdded(30627),
trimmerResourceRemoved(30628),
trimmerRecoverableFailure(30629),
trimmerUnrecoverableFailure(30630),
trimmerRecoverableStorageError(30631),
trimmerUnrecoverableStorageError(30632),
trimmerMotorFailure(30633),
trimmerMemoryExhausted(30634),
trimmerUnderTemperature(30635),
trimmerOverTemperature(30636),
trimmerTimingFailure(30637),
trimmerThermistorFailure(30638),

-- FinDeviceTypeTC = dieCutter(7)
dieCutterCoverOpen(30703),
dieCutterCoverClosed(30704),
dieCutterInterlockOpen(30705),
dieCutterInterlockClosed(30706),
dieCutterConfigurationChange(30707),
dieCutterJam(30708),
dieCutterMissing(30709),
dieCutterLifeAlmostOver(30710),
dieCutterLifeOver(30711),
dieCutterAlmostEmpty(30712),
dieCutterEmpty(30713),
dieCutterAlmostFull(30714),
dieCutterFull(30715),
dieCutterNearLimit(30716),
dieCutterAtLimit(30717),
dieCutterOpened(30718),
dieCutterClosed(30719),
dieCutterTurnedOn(30720),
dieCutterTurnedOff(30721),
```

```
dieCutterOffline(30722),
dieCutterPowerSaver(30723),
dieCutterWarmingUp(30724),
dieCutterAdded(30725),
dieCutterRemoved(30726),
dieCutterResourceAdded(30727),
dieCutterResourceRemoved(30728),
dieCutterRecoverableFailure(30729),
dieCutterUnrecoverableFailure(30730),
dieCutterRecoverableStorageError(30731),
dieCutterUnrecoverableStorageError(30732),
dieCutterMotorFailure(30733),
dieCutterMemoryExhausted(30734),
dieCutterUnderTemperature(30735),
dieCutterOverTemperature(30736),
dieCutterTimingFailure(30737),
dieCutterThermistorFailure(30738),
```

```
-- FinDeviceTypeTC = puncher(8)
puncherCoverOpen(30803),
puncherCoverClosed(30804),
puncherInterlockOpen(30805),
puncherInterlockClosed(30806),
puncherConfigurationChange(30807),
puncherJam(30808),
puncherMissing(30809),
puncherLifeAlmostOver(30810),
puncherLifeOver(30811),
puncherAlmostEmpty(30812),
puncherEmpty(30813),
puncherAlmostFull(30814),
puncherFull(30815),
puncherNearLimit(30816),
puncherAtLimit(30817),
puncherOpened(30818),
puncherClosed(30819),
puncherTurnedOn(30820),
puncherTurnedOff(30821),
puncherOffline(30822),
puncherPowerSaver(30823),
puncherWarmingUp(30824),
puncherAdded(30825),
puncherRemoved(30826),
puncherResourceAdded(30827),
puncherResourceRemoved(30828),
puncherRecoverableFailure(30829),
puncherUnrecoverableFailure(30830),
puncherRecoverableStorageError(30831),
puncherUnrecoverableStorageError(30832),
puncherMotorFailure(30833),
puncherMemoryExhausted(30834),
puncherUnderTemperature(30835),
puncherOverTemperature(30836),
puncherTimingFailure(30837),
puncherThermistorFailure(30838),
```

```
-- FinDeviceTypeTC = perforater(9)
```

```
perforaterCoverOpen(30903),
perforaterCoverClosed(30904),
perforaterInterlockOpen(30905),
perforaterInterlockClosed(30906),
perforaterConfigurationChange(30907),
perforaterJam(30908),
perforaterMissing(30909),
perforaterLifeAlmostOver(30910),
perforaterLifeOver(30911),
perforaterAlmostEmpty(30912),
perforaterEmpty(30913),
perforaterAlmostFull(30914),
perforaterFull(30915),
perforaterNearLimit(30916),
perforaterAtLimit(30917),
perforaterOpened(30918),
perforaterClosed(30919),
perforaterTurnedOn(30920),
perforaterTurnedOff(30921),
perforaterOffline(30922),
perforaterPowerSaver(30923),
perforaterWarmingUp(30924),
perforaterAdded(30925),
perforaterRemoved(30926),
perforaterResourceAdded(30927),
perforaterResourceRemoved(30928),
perforaterRecoverableFailure(30929),
perforaterUnrecoverableFailure(30930),
perforaterRecoverableStorageError(30931),
perforaterUnrecoverableStorageError(30932),
perforaterMotorFailure(30933),
perforaterMemoryExhausted(30934),
perforaterUnderTemperature(30935),
perforaterOverTemperature(30936),
perforaterTimingFailure(30937),
perforaterThermistorFailure(30938),

-- FinDeviceTypeTC = slitter(10)
slitterCoverOpen(31003),
slitterCoverClosed(31004),
slitterInterlockOpen(31005),
slitterInterlockClosed(31006),
slitterConfigurationChange(31007),
slitterJam(31008),
slitterMissing(31009),
slitterLifeAlmostOver(31010),
slitterLifeOver(31011),
slitterAlmostEmpty(31012),
slitterEmpty(31013),
slitterAlmostFull(31014),
slitterFull(31015),
slitterNearLimit(31016),
slitterAtLimit(31017),
slitterOpened(31018),
slitterClosed(31019),
slitterTurnedOn(31020),
slitterTurnedOff(31021),
```

```
slitterOffline(31022),
slitterPowerSaver(31023),
slitterWarmingUp(31024),
slitterAdded(31025),
slitterRemoved(31026),
slitterResourceAdded(31027),
slitterResourceRemoved(31028),
slitterRecoverableFailure(31029),
slitterUnrecoverableFailure(31030),
slitterRecoverableStorageError(31031),
slitterUnrecoverableStorageError(31032),
slitterMotorFailure(31033),
slitterMemoryExhausted(31034),
slitterUnderTemperature(31035),
slitterOverTemperature(31036),
slitterTimingFailure(31037),
slitterThermistorFailure(31038),

-- FinDeviceTypeTC = separationCutter(11)
separationCutterCoverOpen(31103),
separationCutterCoverClosed(31104),
separationCutterInterlockOpen(31105),
separationCutterInterlockClosed(31106),
separationCutterConfigurationChange(31107),
separationCutterJam(31108),
separationCutterMissing(31109),
separationCutterLifeAlmostOver(31110),
separationCutterLifeOver(31111),
separationCutterAlmostEmpty(31112),
separationCutterEmpty(31113),
separationCutterAlmostFull(31114),
separationCutterFull(31115),
separationCutterNearLimit(31116),
separationCutterAtLimit(31117),
separationCutterOpened(31118),
separationCutterClosed(31119),
separationCutterTurnedOn(31120),
separationCutterTurnedOff(31121),
separationCutterOffline(31122),
separationCutterPowerSaver(31123),
separationCutterWarmingUp(31124),
separationCutterAdded(31125),
separationCutterRemoved(31126),
separationCutterResourceAdded(31127),
separationCutterResourceRemoved(31128),
separationCutterRecoverableFailure(31129),
separationCutterUnrecoverableFailure(31130),
separationCutterRecoverableStorageError(31131),
separationCutterUnrecoverableStorageError(31132),
separationCutterMotorFailure(31133),
separationCutterMemoryExhausted(31134),
separationCutterUnderTemperature(31135),
separationCutterOverTemperature(31136),
separationCutterTimingFailure(31137),
separationCutterThermistorFailure(31138),

-- FinDeviceTypeTC = imprinter(12)
```

```
imprinterCoverOpen(31203),
imprinterCoverClosed(31204),
imprinterInterlockOpen(31205),
imprinterInterlockClosed(31206),
imprinterConfigurationChange(31207),
imprinterJam(31208),
imprinterMissing(31209),
imprinterLifeAlmostOver(31210),
imprinterLifeOver(31211),
imprinterAlmostEmpty(31212),
imprinterEmpty(31213),
imprinterAlmostFull(31214),
imprinterFull(31215),
imprinterNearLimit(31216),
imprinterAtLimit(31217),
imprinterOpened(31218),
imprinterClosed(31219),
imprinterTurnedOn(31220),
imprinterTurnedOff(31221),
imprinterOffline(31222),
imprinterPowerSaver(31223),
imprinterWarmingUp(31224),
imprinterAdded(31225),
imprinterRemoved(31226),
imprinterResourceAdded(31227),
imprinterResourceRemoved(31228),
imprinterRecoverableFailure(31229),
imprinterUnrecoverableFailure(31230),
imprinterRecoverableStorageError(31231),
imprinterUnrecoverableStorageError(31232),
imprinterMotorFailure(31233),
imprinterMemoryExhausted(31234),
imprinterUnderTemperature(31235),
imprinterOverTemperature(31236),
imprinterTimingFailure(31237),
imprinterThermistorFailure(31238),

-- FinDeviceTypeTC = wrapper(13)
wrapperCoverOpen(31303),
wrapperCoverClosed(31304),
wrapperInterlockOpen(31305),
wrapperInterlockClosed(31306),
wrapperConfigurationChange(31307),
wrapperJam(31308),
wrapperMissing(31309),
wrapperLifeAlmostOver(31310),
wrapperLifeOver(31311),
wrapperAlmostEmpty(31312),
wrapperEmpty(31313),
wrapperAlmostFull(31314),
wrapperFull(31315),
wrapperNearLimit(31316),
wrapperAtLimit(31317),
wrapperOpened(31318),
wrapperClosed(31319),
wrapperTurnedOn(31320),
wrapperTurnedOff(31321),
```

```
wrapperOffline(31322),
wrapperPowerSaver(31323),
wrapperWarmingUp(31324),
wrapperAdded(31325),
wrapperRemoved(31326),
wrapperResourceAdded(31327),
wrapperResourceRemoved(31328),
wrapperRecoverableFailure(31329),
wrapperUnrecoverableFailure(31330),
wrapperRecoverableStorageError(31331),
wrapperUnrecoverableStorageError(31332),
wrapperMotorFailure(31333),
wrapperMemoryExhausted(31334),
wrapperUnderTemperature(31335),
wrapperOverTemperature(31336),
wrapperTimingFailure(31337),
wrapperThermistorFailure(31338),

-- FinDeviceTypeTC = bander(14)
banderCoverOpen(31403),
banderCoverClosed(31404),
banderInterlockOpen(31405),
banderInterlockClosed(31406),
banderConfigurationChange(31407),
banderJam(31408),
banderMissing(31409),
banderLifeAlmostOver(31410),
banderLifeOver(31411),
banderAlmostEmpty(31412),
banderEmpty(31413),
banderAlmostFull(31414),
banderFull(31415),
banderNearLimit(31416),
banderAtLimit(31417),
banderOpened(31418),
banderClosed(31419),
banderTurnedOn(31420),
banderTurnedOff(31421),
banderOffline(31422),
banderPowerSaver(31423),
banderWarmingUp(31424),
banderAdded(31425),
banderRemoved(31426),
banderResourceAdded(31427),
banderResourceRemoved(31428),
banderRecoverableFailure(31429),
banderUnrecoverableFailure(31430),
banderRecoverableStorageError(31431),
banderUnrecoverableStorageError(31432),
banderMotorFailure(31433),
banderMemoryExhausted(31434),
banderUnderTemperature(31435),
banderOverTemperature(31436),
banderTimingFailure(31437),
banderThermistorFailure(31438),

-- FinDeviceTypeTC = makeEnvelope(15)
```



```
makeEnvelopeCoverOpen(31503),
makeEnvelopeCoverClosed(31504),
makeEnvelopeInterlockOpen(31505),
makeEnvelopeInterlockClosed(31506),
makeEnvelopeConfigurationChange(31507),
makeEnvelopeJam(31508),
makeEnvelopeMissing(31509),
makeEnvelopeLifeAlmostOver(31510),
makeEnvelopeLifeOver(31511),
makeEnvelopeAlmostEmpty(31512),
makeEnvelopeEmpty(31513),
makeEnvelopeAlmostFull(31514),
makeEnvelopeFull(31515),
makeEnvelopeNearLimit(31516),
makeEnvelopeAtLimit(31517),
makeEnvelopeOpened(31518),
makeEnvelopeClosed(31519),
makeEnvelopeTurnedOn(31520),
makeEnvelopeTurnedOff(31521),
makeEnvelopeOffline(31522),
makeEnvelopePowerSaver(31523),
makeEnvelopeWarmingUp(31524),
makeEnvelopeAdded(31525),
makeEnvelopeRemoved(31526),
makeEnvelopeResourceAdded(31527),
makeEnvelopeResourceRemoved(31528),
makeEnvelopeRecoverableFailure(31529),
makeEnvelopeUnrecoverableFailure(31530),
makeEnvelopeRecoverableStorageError(31531),
makeEnvelopeUnrecoverableStorageError(31532),
makeEnvelopeMotorFailure(31533),
makeEnvelopeMemoryExhausted(31534),
makeEnvelopeUnderTemperature(31535),
makeEnvelopeOverTemperature(31536),
makeEnvelopeTimingFailure(31537),
makeEnvelopeThermistorFailure(31538),

-- FinDeviceTypeTC = stacker(16)
stackerCoverOpen(31603),
stackerCoverClosed(31604),
stackerInterlockOpen(31605),
stackerInterlockClosed(31606),
stackerConfigurationChange(31607),
stackerJam(31608),
stackerMissing(31609),
stackerLifeAlmostOver(31610),
stackerLifeOver(31611),
stackerAlmostEmpty(31612),
stackerEmpty(31613),
stackerAlmostFull(31614),
stackerFull(31615),
stackerNearLimit(31616),
stackerAtLimit(31617),
stackerOpened(31618),
stackerClosed(31619),
stackerTurnedOn(31620),
stackerTurnedOff(31621),
```

```
stackerOffline(31622),
stackerPowerSaver(31623),
stackerWarmingUp(31624),
stackerAdded(31625),
stackerRemoved(31626),
stackerResourceAdded(31627),
stackerResourceRemoved(31628),
stackerRecoverableFailure(31629),
stackerUnrecoverableFailure(31630),
stackerRecoverableStorageError(31631),
stackerUnrecoverableStorageError(31632),
stackerMotorFailure(31633),
stackerMemoryExhausted(31634),
stackerUnderTemperature(31635),
stackerOverTemperature(31636),
stackerTimingFailure(31637),
stackerThermistorFailure(31638),

-- FinDeviceTypeTC = sheetRotator(17)
sheetRotatorCoverOpen(31703),
sheetRotatorCoverClosed(31704),
sheetRotatorInterlockOpen(31705),
sheetRotatorInterlockClosed(31706),
sheetRotatorConfigurationChange(31707),
sheetRotatorJam(31708),
sheetRotatorMissing(31709),
sheetRotatorLifeAlmostOver(31710),
sheetRotatorLifeOver(31711),
sheetRotatorAlmostEmpty(31712),
sheetRotatorEmpty(31713),
sheetRotatorAlmostFull(31714),
sheetRotatorFull(31715),
sheetRotatorNearLimit(31716),
sheetRotatorAtLimit(31717),
sheetRotatorOpened(31718),
sheetRotatorClosed(31719),
sheetRotatorTurnedOn(31720),
sheetRotatorTurnedOff(31721),
sheetRotatorOffline(31722),
sheetRotatorPowerSaver(31723),
sheetRotatorWarmingUp(31724),
sheetRotatorAdded(31725),
sheetRotatorRemoved(31726),
sheetRotatorResourceAdded(31727),
sheetRotatorResourceRemoved(31728),
sheetRotatorRecoverableFailure(31729),
sheetRotatorUnrecoverableFailure(31730),
sheetRotatorRecoverableStorageError(31731),
sheetRotatorUnrecoverableStorageError(31732),
sheetRotatorMotorFailure(31733),
sheetRotatorMemoryExhausted(31734),
sheetRotatorUnderTemperature(31735),
sheetRotatorOverTemperature(31736),
sheetRotatorTimingFailure(31737),
sheetRotatorThermistorFailure(31738),

-- FinDeviceTypeTC = inserter(18)
```

```
insertCoverOpen(31803),
insertCoverClosed(31804),
insertInterlockOpen(31805),
insertInterlockClosed(31806),
insertConfigurationChange(31807),
insertJam(31808),
insertMissing(31809),
insertLifeAlmostOver(31810),
insertLifeOver(31811),
insertAlmostEmpty(31812),
insertEmpty(31813),
insertAlmostFull(31814),
insertFull(31815),
insertNearLimit(31816),
insertAtLimit(31817),
insertOpened(31818),
insertClosed(31819),
insertTurnedOn(31820),
insertTurnedOff(31821),
insertOffline(31822),
insertPowerSaver(31823),
insertWarmingUp(31824),
insertAdded(31825),
insertRemoved(31826),
insertResourceAdded(31827),
insertResourceRemoved(31828),
insertRecoverableFailure(31829),
insertUnrecoverableFailure(31830),
insertRecoverableStorageError(31831),
insertUnrecoverableStorageError(31832),
insertMotorFailure(31833),
insertMemoryExhausted(31834),
insertUnderTemperature(31835),
insertOverTemperature(31836),
insertTimingFailure(31837),
insertThermistorFailure(31838)
```

9 Internationalization Considerations

In section 5, this document defines the new human-readable, localized "printer-alert-description" IPP Printer attribute using the existing 'text' syntax defined in section 4.1.1 of [RFC2911]. Values of this new attribute MUST copy their natural language tag [RFC4646] from the values of 'prtLocalizationLanguage', 'prtLocalizationCountry', and 'prtGeneralCurrentLocalization' [RFC3805]. Values of this new attribute MUST also be converted from the charset specified by the values of 'prtLocalizationCharacterSet' and 'prtGeneralCurrentLocalization' [RFC3805] to the charset specified by "charset-configured" (defaults to UTF-8 [RFC3629]).

In section 5, this document defines new keyword attribute values for "printer-state-reasons" [RFC2911] for Printer Subunits [RFC3805] and a new machine-readable attribute "printer-alert". Localization by the IPP Printer does NOT apply to these machine-readable attributes.

In section 6, this document defines new keyword attribute values for "printer-state-reasons" [RFC2911] for Finishing Subunits [RFC3806] and new corresponding enumerated attribute values for the 'PrtAlertCodeTC' textual convention [RFC3805] [IANAPRT]. Localization by the IPP Printer or SNMP Printer MIB Agent does NOT apply to these machine-readable attributes and values.

Therefore, this document conforms to 'IETF Policy on Character Sets and Languages' [RFC2277].

See section 7 'Internationalization Considerations' in [RFC2911] and section 8 'Internationalization Considerations' in [RFC3805].

10 Security Considerations

This document adds no new security considerations to the IETF Printer MIB v2 [RFC3805] or IETF IPP/1.1 [RFC2911]. In section 5, this document defines extensions to one existing REQUIRED IPP Printer Description attribute "printer-state-reasons" defined in [RFC2911]. This document also defines two new RECOMMENDED IPP Printer Description attributes "printer-alert" and "printer-alert-description". All three are IPP Printer Description attributes as defined in [RFC2911].

In section 6, this document defines extensions to one existing REQUIRED Printer MIB columnar object 'prtAlertCode' defined in [RFC3805] via extensions to one existing textual convention 'PrtAlertCodeTC' defined in [IANAPRT].

See section 8 'Security Considerations' in [RFC2911] and section 9 'Security Considerations' in [RFC3805].

11 Acknowledgements

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12 References

12.1 Normative References

- [CIMALERT] Landau, McDonald
CIM_PrintAlertRecord class, published in DMFT CIM Schema v2.20,
http://www.dmtf.org/standards/cim/cim_schema_v220/
- [IANAFIN] Bergman, Lewis, McDonald.
IANA Finisher MIB, originally published in RFC 3806, June 2004,
<http://www.iana.org/assignments/ianafinisher-mib>
- [IANAIPP] Hastings, McDonald.
IANA IPP Registry, established in RFC 2911, September 2000.
<http://www.iana.org/assignments/ipp-registrations>
- [IANAPRT] Bergman, Lewis, McDonald.
IANA Printer MIB, originally published in RFC 3805, June 2004.
<http://www.iana.org/assignments/ianaprinter-mib>
- [RFC2119] Bradner.
Key words for use in RFCs to Indicate Requirement Levels, RFC 2119,
March 1997.
- [RFC2616] Fielding, Gettys, Mogul, Frystyk, Masinter, Leach,
Berners-Lee. IETF HTTP/1.1, RFC 2616, June 1999.
- [RFC2910] Herriot, Butler, Moore, Turner, Wenn.
IPP/1.1: Encoding and Transport, RFC 2910, September 2000.
(obsoletes [RFC2565])
- [RFC2911] Hastings, Herriot, deBry, Isaacson, Powell.
IPP/1.1: Model and Semantics, RFC 2911, September 2000.
(obsoletes [RFC2566])
- [RFC2978] Freed, Postel.
IANA Charset Registration Procedures, RFC 2978, October 2000.
- [RFC3411] Harrington, Presuhn, Wijnen.
IETF Architecture for Describing SNMP Management Frameworks,
RFC 3411, December 2002.
- [RFC3414] Blumenthal, Wijnen.
IETF User-based Security Model (USM) for SNMPv3, RFC 3414,
December 2002.
- [RFC3629] Yergeau.
UTF-8, a transformation format of ISO 10646, RFC 3629
November 2003.
- [RFC3805] Bergman, Lewis, McDonald.
IETF Printer MIB v2, RFC 3805, June 2004.
- [RFC3806] Bergman, Lewis, McDonald.
IETF Printer Finishing MIB, RFC 3806, June 2004.

- [RFC3808] McDonald.
IANA Charset MIB, RFC 3808, June 2004.
- [RFC4646] Phillips, Davis.
Tags for Identifying Languages, RFC 4646, September 2006.
(obsoletes RFC 3066)
- [RFC5234] Crocker, Overell.
Augmented BNF for Syntax Specifications, RFC 5234, January 2008.
- [US-ASCII]
Coded Character Set -- 7-Bit American Standard Code for
Information Interchange, ANSI X3.4-1986.

12.2 Informative References

- [RFC1157] Case, Fedor, Schoffstall, Davin.
IETF Simple Network Management Protocol (SNMP), RFC 1157, May 1990.
- [RFC1759] Smith, Wright, Hastings, Zilles, Gyllenskog.
IETF Printer MIB v1, RFC 1759, March 1995.
(obsoleted by [RFC3805])
- [RFC1945] Berners-Lee, Fielding.
IETF HTTP/1.0, RFC 1945, May 1996.
(obsoleted by [RFC2616])
- [RFC2277] Alvestrand.
IETF Policy on Character Sets and Languages, BCP 18 / RFC 2277,
January 1998.
- [RFC2565] Herriot, Butler, Moore, Turner.
IPP/1.0: Encoding and Transport, RFC 2565, April 1999.
(obsoleted by [RFC2910])
- [RFC2566] Hastings, Herriot, deBry, Isaacson, Powell.
IPP/1.0: Model and Semantics, RFC 2566, April 1999.
(obsoleted by [RFC2911])
- [RFC2817] Khare, Lawrence.
IETF Upgrading to TLS Within HTTP/1.1, RFC 2817, May 2000.
- [RFC3382] deBry, Hastings, Herriot, Ocke, Zehler.
IETF IPP 'collection' attribute syntax, RFC 3382, September 2002.
- [RFC3995] Herriot, Hastings.
IETF IPP Event Notifications & Subscriptions, RFC 3995, March 2005.
- [WIMS-CIM] IEEE-ISTO PWG WIMS WG - CIM Refresh Project
<http://www.pwg.org/mailhelp.html> - subscribe to WIMS mailing list
<ftp://www.pwg.org/wims/cim> - archive of WIMS-CIM planning papers
<ftp://www.pwg.org/wims/wd> - archive of WIMS-CIM working drafts
http://www.dmtf.org/standards/cim/cim_schema_v220/ - CIM_Printer,
CIM_PrintAlertRecord, etc. (complete Printer MIB mapping)

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14 Appendix A - Design Alternatives (Informative)

This section provides durable documentation of the 'road not taken' on various design alternatives during the development of this document.

14.1 Printer Alert Encoding in Collection Attribute

A note to the IPP WG mailing list on 19 July 2006 proposed an alternative to encode the columnar objects from 'prtAlertTable' in a new IPP Printer attribute using the 'collection' syntax defined in section 3 of [RFC3382].

14.1.1 Rationale for Rejection

The IPP WG rejected this proposal because it would make support of this document dependent on support for the IPP 'collection' syntax (not widely supported in IPP/1.1 [RFC2911] [RFC2910] implementations and not known to be supported in any IPP/1.0 [RFC2566] [RFC2565] implementation).

14.2 Printer Alert Encoding in New Object

A note to the IPP WG mailing list on 19 July 2006 proposed an alternative to encode the columnar objects from 'prtAlertTable' in a new first-class IPP object.

14.2.1 Rationale for Rejection

The IPP WG rejected this proposal because it would NOT be compatible with any deployed IPP implementation (because it would require a new IPP request attribute group over-the-wire).

14.3 Printer Alert Encoding in Parallel Attributes

A note to the IPP WG mailing list on 19 July 2006 proposed an alternative to encode the columnar objects from 'prtAlertTable' in an a set of ordered parallel IPP Printer attributes.

14.3.1 Rationale for Rejection

The IPP WG rejected this proposal because it would NOT be robust (because ordering is NOT required by the '1setOf X' syntax defined in section 4.1.6 of [RFC2911]) and would NOT be compatible with vendor extensions.

14.4 Printer Alert Encoding in State Message

The initial draft of this specification proposed an optimization (to avoid the definition of any new IPP Printer attributes) by overloading the existing IPP Printer attribute "printer-state-message" to encode columnar objects from 'prtAlertTable' in a structured string.

14.4.1 Rationale for Rejection

The IPP WG rejected this proposal because it would have forced IPP Printer "printer-state-message" values to be locale-independent (illegal for the 'text' syntax defined in section 4.1.1 of [RFC2911]).

14.5 Printer Alert Group Finishing Extensions

The initial draft of this specification proposed an optimization (to avoid the definition of many new Finishing Subunit-specific values of 'PrtAlertCodeTC' and IPP Printer attribute "printer-state-reasons") by defining one new value of 'PrtAlertGroupTC' for each value of of the IANA Finisher MIB 'FinDeviceTypeTC' (originally published in [RFC3806]) used in the non-index object 'finDeviceType' in 'finDeviceTable' and NOT included in 'prtAlertTable'.

14.5.1 Rationale for Rejection

The IPP WG rejected this optimization because it would have made IPP Printer "printer-state-reasons" values ambiguous for all Finishing Subunits (because the generic 'subunit-xxx' alert values were used).

14.6 Printer Alert Subset for Finishing Subunits

Previous versions of this document defined a subset of specific subunit alerts for each Finishing Subunit.

14.6.1 Rationale for Rejection

Lively discussion during the review at the PWG Lexington face-to-face (27 October 2006) resulted in a consensus to expand to a complete set of specific subunit alerts for each Finishing Subunit.