ANNEX V. RPM DAILY FILES NAME AND DATA STRUCTURE

1. Scope

This Annex describes the requirements for the Daily Files that should be created by the RPM.

2. File Name Requirements

The file name for the daily files should include the following elements:

- Country Designation;
- Site designation;
- Lane designation;
- Equipment identification;
- Format guideline version number according to which the file is generated;
- Date; and
- Extension.

The specific designation of each component of the Daily File name, each separated by an underscore character should be as follows:

- <Field 1> = Country Designation – a two character Country Designation, according to the ISO 3166 A2 two letter code designation (e.g., GR, UA);
- <Field 2> = Site Designation – 1-20 character site designation
- <Field 3> = Lane Designation – a four-character alphanumeric lane abbreviation, unique for each lane, with a capital "L" followed by three digits (e.g., L001);
- <Field 4> = Equipment Designation – a six character descriptor of the equipment model (e.g., TVM250, YTR-1A, SP2100, etc.)
- <Field 5> = Guideline Version Number – four characters, with a lower case "v" followed by three digits (e.g., v001)
- <Field 6> = Date – 10-character, dash-delimited and of the form: yyyy-mm-dd, using leading zeros to file in fields (e.g., 2006-05-07)
- <Field 7> = File extension – three characters (e.g., *.n42 = file extension type for N42.42 files, *.txt for text files).

Below is an example a Daily File name generated by an RPM at Saida port at lane L001 on 16 October 2008:

LB_Saida_L001_2008-10-16.txt

3. File Structure Requirements

The data in the Daily Files should be ASCII characters.

The Daily File should contain tree blocks of data. Each line in the file consists of fields that are comma delimited.

<Field#1>,<Field#2>,<Field#3> CRLF

- **<Field#1> =** Data stream – Field#1 consists of the exact data stream transcribed straight from the portal with trailing whitespace removed,
- **<Field#2> =** Time –dash delimited and of the form: hh-mm-ss.sss

- **<Field#3>** = Other – This is a space for additional information not contained in the data stream (e.g., Instrument information, manufacturer, model, serial number). Zero or more comma delimited fields may follow before the CRLF.

Each line is terminated by a carriage return line feed (CRLF) character sequence.

The data stream, or output string, consists of two characters followed by four detector counts that are comma delineated. The detector count field should be equal to the number of detector panels in the portal monitor. The string is ASCII characters with a carriage return line feed at the end.

The data stream is generally required to contain the following:

- Status of health;
  - Set-up parameters
  - The background count rate should be recorded for each RPM detector, both gamma and neutron, at the moment of creation the file, and at regular intervals throughout operation.

- Status of operation.
  - General information about the number of alarms and number of occupancies for the entire period of time should be recorded.
  - Count rates recorded for each detector, both gamma and neutron, radiation fault alarms, at regular intervals for the duration of the alarm, and the threshold settings for each alarm.
  - Indications of tampers registered by the RPM, with start and end times,

- Alarm data
  - Count rates recorded for each detector, both gamma and neutron, during alarm-generating occupancies, at regular intervals for the duration of the alarm, and the threshold settings for each alarm.
  -
  - Threshold neutron, which should be indicated in the RPM Manual how the threshold is being defined; and
  - Threshold gamma in sigma.

Format recommendations for output strings are provided below.

Set-up Output Strings:
Note: The following "setup" messages are sent if there is communication link established to the computer generating the Daily File, on power up, at midnight according to the internal clock, and whenever internal parameters may have been changed, and at other times based on the firmware of individual RPM vendors.

Output: SG1,XXXXXX,XXXXXX,XX,XX,XX.X,P CRLF
Definition: "S"etup "G"amma 1, Background High fault Alarm (XXXXXX), Background Low fault Alarm (XXXXXX), Intervals(XX), Occupancy hold-in (XX), NSigma (XX.X).

Background High and Low fault alarms units are in counts per second per detector.
Intervals and Occupancy hold-in units and intervals may vary according to RPM manufacturer.
NSigma is a float value used in the alarm algorithm.
P = a place holder to make the message 32 bytes to match all other messages.

Example: SG1,005000,000050,05,05,04.3,P

Output: SG2,XXXX,X.XXX,X.XXX,X,XXXX,X CRLF
Definition: "S"etup "G"amma 2, Detectors on line (XXXX), Master Lower level discriminator (X.XXX), Master Upper level discriminator (X.XXX), Relay output (X), Algorithm (XXXX) or firmware version (X).

XXXX = Detectors on line; 1100 = Masters ON Slave OFF.
X.XXX = Master Upper level discriminators voltages
Position definition –first number Master (upper or lower), Second number Master (upper or lower), Third number Slave (upper or lower), Fourth number Slave (upper or lower)
Note: Positions configurations may vary and should be identified by the RPM manufacturer).
X.XXX = Master Lower level discriminator voltages
Position definition –first number Master (upper or lower), Second number Master (upper or lower), Third number Slave (upper or lower), Fourth number Slave (upper or lower)
Note: Positions configurations may vary and should be identified by the RPM manufacturer).
X=Relay Output; 0 = OFF 1= ON 3= AUTO
XXXX = Algorithm; 1010 = SUM & VERTICAL.
Position definition – First number SUM, Second number HORIZONTAL, Third number VERTICAL, Fourth number SINGLE.
P = a place holder to make the message 32 bytes to match all other messages.

Example: SG2,1111,0.069,0.455,01,1010,P

Output: SG3,0.068,0.455,20,0.00,1.08.8 CRLF
Definition: "S"etup "G"amma 3, Slave Lower level discriminator (X.XXX), Slave Upper Level discriminator (X.XXX), Background Time (XX), Background NSigma (X.XX), Software Version (XXXXXX).

X.XXX = Slave Lower level discriminators voltages
Position definition –first number Master (upper or lower), Second number Master (upper or lower), Third number Slave (upper or lower), Fourth number Slave (upper or lower)
Note: Positions configurations may vary and should be identified by the RPM manufacturer).
X.XXX = Slave Upper level discriminator voltages
Position definition –first number Master (upper or lower), Second number Master (upper or lower), Third number Slave (upper or lower), Fourth number Slave (upper or lower)
XX = Background time in seconds.
X.XX = Background NSigma is a float used for throw through (should be 0.00).
XXXXXX = Software Version (six character limit).

Example: SG3,0.069,0.455,20,0.00,1.08.8

Output: SN1,XXXXXX,XX,XXXX,XXXX,XX,XXX **CRLF**
Definition: "S"etup "N"eutron 1,High neutron fault alarm (XXXXXX), Maximum Intervals (XX), Alpha value (XXXX), Zmax value (XXXX), Sequential intervals (XX), Neutron averaging period (XXX).

XXXXXX=Background High fault alarm units are in counts per second per neutron detector block.

XX= Maximum Intervals used in the SPRT algorithm.
XXXX = Alpha a false alarm probability used in SPRT.
XXXX=Zmax the value used for an alarm when max intervals is reached.

XX=Sequential intervals is the amount of 200 millisecond intervals that must be above background. A filter used to stop cosmic nuisance alarms.

XXX = The neutron averaging period. The example below indicates an averaging period of 120 seconds.

Leading zeros are required to make the parameter length exactly three characters and to make the message exactly 32 bytes.

Example: SN1,000050,02,0047,1200,02,120

Output: SN2,X.XXX,X.XXX,X.XXX,X.XXX,PP CRLF
Definition: "S"etup "N"eutron 2, Master Lower level discriminator (X.XXX), Master Upper level discriminator (X.XXX), Slave Lower level discriminator (X.XXX), Slave Upper level discriminator (X.XXX)

X.XXX = Master Lower level discriminators voltages.
X.XXX = Master Upper level discriminator voltages.
X.XXX = Slave Lower level discriminators voltages.
X.XXX= Slave Upper level discriminator voltages.
PP = a place holder to make the message 32 bytes to match all other messages.

Example: SN2,0.504,5.040,0.504,5.040,PP

Gamma and Neutron Background Output Strings:
Output: GB,xxxxx,xxxxx,xxxxx,xxxxx CRLF
Definition: Gamma Background sent every averaging period. (Note: vendor should describe count-rate interval, length of any buffer, and number and duration of averaging periods.

Example: GB,000536,000534,000589,000527

Output: NB,xxxxx,xxxxx,xxxxx,xxxxx CRLF
Definition: Neutron Background sent every averaging period. (Note: vendor should describe count-rate interval, length of any buffer, and number and duration of averaging periods.

Example: NB,000005,000006,000004,000006

Occupancy Output Strings:
Output: GX,xxxxxx,yyyyyy,000000,000000 CRLF
Definition: Pillar occupancy count since midnight of each day and neutron background count rate.
xxxxxx = 1–999999 occupancies.
yyyyyy = neutron background at the beginning of the occupancy, multiplied by 1000.

This message is sent with an incremented count, and an updated neutron background every time the pillar clears the occupancy. The occupancy count is automatically cleared on a power cycle and at midnight each day. A neutron background in excess of 999.999 counts/second will be reported as 999999. Fields shall include necessary leading zeros to conform with field length requirements.

Example: GX,005098,012345,000000,000000
Note: The example given indicates that immediately preceding occupancy 5098, the neutron background was 12.345 counts per second.

Velocity Output Strings:

Output: SP, 0.1234, 04.234, 006.23, 000000 CRLF
Definition: The first field is time to cover the distance between occupancy sensors, second field is MPH (99 max), third field is KPH (999 max), pad, CRLF

Example: SP,1.2450,05.004,10.008,000000

Alarm Output Strings:
Output: GA,xxxxx,xxxxx,xxxxx,xxxxx CRLF
Definition: Gamma counts sent every sampling period (according to RPM manufacturer) while occupied and in an alarm state. (Note: vendor should describe count-rate interval).

Example: GA,000115,000195,000145,000118

Output: GS,xxxxx,xxxxx,xxxxx,xxxxx CRLF
Definition: Gamma counts sent every interval (may vary per RPM manufacturer) while occupied and not in an alarm state. (Note: vendor should describe interval, length of any buffer, and number and duration of averaging periods.)

Example: GS,000105,000095,000125,000108

Output: NS,xxxxx,xxxxx,xxxxx,xxxxx CRLF
Definition: Neutron counts sent every interval while occupied and not in an alarm state. (Note: vendor should describe the interval).

Example: NS,000005,000005,000005,000005

Output: NA,xxxxx,xxxxx,xxxxx,xxxxx CRLF
Definition: Neutron counts sent every interval while occupied and in an alarm state. (Note: vendor should describe interval)

Example: NA,000005,000005,000005,000005

Radiation Fault Output Strings (Where applicable by manufacturer):
Output: GH,xxxxx,xxxxx,xxxxx,xxxxx CRLF
Definition: Gamma High Fault Background sent every interval (may vary per RPM manufacturer). (Note: vendor should describe count-rate interval, length of any buffer, and number and duration of averaging periods). The high background fault condition should be a settable parameter.

Example: GH,000226,000254,001308,000251

Output: GL,xxxxx,xxxxx,xxxxx,xxxxx CRLF
Definition: Gamma Low Fault Background sent interval (Note: vendor should describe count-rate interval, length of any buffer, and number and duration of averaging periods.). The low background fault condition should be a settable parameter.

Example: GL,000226,000254,000008,000351

Output: NH,xxxxx,xxxxx,xxxxx,xxxxx CRLF
Definition: Neutron High Fault Background sent every interval as determined by the RPM manufacturer. The one-second counts are averaged from a 20-second count buffer. The 20 second buffer is based on four 5-second rolling averages. The high background fault condition is a settable parameter in the controller.

Example: NH,000006,000004,000008,000051

Tamper Output Strings (Where applicable by manufacturer):
Output: TT,000000,000000,000000,000000 CRLF
Definition: Tamper condition. This is sent only once when the pillar doors are opened. Fields are padded for 32 bytes.

Output: TC,111111,111111,111111,111111 CRLF
Definition: Tamper condition cleared. This is sent only once when the pillar doors are closed. Fields are padded for 32 bytes.