Physiological Monitor with the Nonin Onyx and Vantage 9590

Tank Farm Maintenance Procedure

Industrial Hygiene

USQ # N/A-4

CHANGE HISTORY (LAST 5 REV-MODS)

<table>
<thead>
<tr>
<th>Rev-Mod</th>
<th>Release Date</th>
<th>Justification</th>
<th>Summary of Changes</th>
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<tr>
<td>B-2</td>
<td>12/05/2017</td>
<td>Industrial Hygiene Request</td>
<td>Updated RadCon section within procedure.</td>
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<tr>
<td>B-1</td>
<td>10/10/2016</td>
<td>Record Management Request</td>
<td>Updated Records Section.</td>
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<tr>
<td>B-0</td>
<td>07/15/2015</td>
<td>Periodic Review</td>
<td>No Changes</td>
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<tr>
<td>A-1</td>
<td>09/18/2014</td>
<td>IHT Request</td>
<td>Changed procedure type to “Routine”</td>
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<tr>
<td>A-0</td>
<td>08/09/2013</td>
<td>New equipment</td>
<td>All pages new</td>
</tr>
</tbody>
</table>

Table of Contents

1.0 PURPOSE AND SCOPE 2
   1.1 Purpose .......................................................... 2
   1.2 Scope ........................................................... 2

2.0 Information ................................................................ 2
   2.1 Terms and Definitions ............................................. 2
   2.2 General Information ............................................... 3

3.0 PRECAUTIONS AND LIMITATIONS ........................................ 4
   3.1 Equipment Safety .................................................. 4
   3.2 Radiation and Contamination Control ......................... 4

4.0 PREREQUISITES ................................................................ 5
   4.1 Special Tools, Equipment, and Supplies ....................... 5
   4.2 Performance Documents ............................................ 5
   4.3 Field Preparation .................................................. 5

5.0 PROCEDURE .................................................................. 6
   5.1 Using the Nonin/Onyx Vantage 9590 Finger Pulse Oximeter 6
   5.2 Records ................................................................. 8
1.0 PURPOSE AND SCOPE

1.1 Purpose

The purpose of this procedure is to ensure the proper use of the Nonin Onyx and Vantage 9590 finger pulse oximeter in support of field monitoring performed in accordance with TF-OPS-IHT-007, TFC-ESHQ-S_IH-C-07.

1.2 Scope

The scope includes proper operation and cleaning of the Nonin pulse oximeter.

2.0 INFORMATION

2.1 Terms and Definitions

- Pulse oximeter – instrument used to measure both heart rate and oxygen saturation of the blood. The oximeter function is not used for the purpose of heat stress monitoring.
- Pulse rate – the number of heart beats per minute.
- Recovery heart rate – the heart rate measured at a point in time (typically 1 minute) after the worker has ended the work cycle. It is a useful tool for heat strain recognition.
2.2 General Information

2.2.1 The Nonin Onyx/Vantage 9590 specifications:
- Temperature range: (23 to 104 °F)
- Humidity range: (10 to 90 %, non-condensing for operations and 10 to 95 %, non-condensing for storage)
- Range: 20 to 250 beats per minute; Accuracy: Plus or minus 3 digits
- Power: Two 1.5 volt, AAA alkaline batteries for about 6,000 spot checks or 36 hours of operation.

2.2.2 Information collected is “Official Use Only.”

2.2.3 This is an objective physiological measurement and not a medical or clinical procedure.

2.2.4 Periodic pulse rates (on the same finger) are collected based on instructions on form A-6006-433, Worker Heart Rate /Temperature Monitoring Form or from the Project Industrial Hygienist. A reading is obtained as quickly as possible after a worker pauses or is surveyed out. Recovery occurs quickly and the best measurement is near the peak activity or to measure a 1 minute recovery heart rate.
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Equipment Safety

**CAUTION** - Overextending the devices spring may cause damage to the device.

3.1.1 Do not use solvents, ammonium chloride solutions or isopropyl alcohol to clean the unit.

3.1.2 This device is not intrinsically safe and should not be used in a flammable atmosphere.

3.2 Radiation and Contamination Control

3.2.1 Planned work in radiological areas must be approved by Radiological Control personnel per the Radiological Risk Screening procedure TFC-ESHQ-RP-RWP-C-01.

3.2.1.1 When performed without a formal work package or approved procedure (i.e., Level 3 or 4 work), this procedure is limited to radiological areas and work activities permitted by a low risk Radiological Work Permit (RWP).

3.2.2 Before conducting sampling or monitoring, contact the responsible Radiological Control personnel for the facility or area to determine any specific survey or monitoring requirements.

- Pre, during, and post contamination survey requirements.
- Any applicable RSP’s for your specific equipment or task.
- Alternative survey or monitoring needs to support the radiological release survey process.

3.2.3 Comply with the requirements set forth by the RWP, HPT coverage, Release Survey Plan (RSP), and any other applicable procedures as determined above.

3.2.4 When exiting radiological areas where no HPT coverage was provided, inform the radiological control personnel of the use/history for the equipment being presented (e.g., only sampled air in the Contamination Area, No known history of contamination based on use, etc.) to aid them in properly evaluating the radiological release criteria needed.
4.0 PREREQUISITES

4.1 Special Tools, Equipment, and Supplies

The following supplies may be needed to perform this procedure:

- Mild detergent or 10% Bleach solution for cleaning
- A timing device capable of keeping track of time in 1 second increments.

4.2 Performance Documents

The following documents may be needed to perform this procedure:

- Record information in accordance with TFC-ESHQ-S_IH-C-46, “Industrial Hygiene Reporting, and Records Management”
- Nonin Onyx and Vantage 9590 instructions (2012)
- TFC-ESHQ-S_IH-C-07, “Heat Stress Control”
- TF-OPS-IHT-007, “Using Direct Reading Instruments.”
- A-6006-433, Worker Heart Rate /Temperature Monitoring Form.

4.3 Field Preparation

4.3.1 IF heat stress mitigation checklist is available, REVIEW the heat stress mitigation checklist and any additional written instruction from the project Industrial Hygienist.

4.3.2 WHEN performed in radiological area controlled for contamination, NOTIFY HPT prior to use of pulse rate monitoring device.

4.3.3 AFTER a finger is inserted, CHECK battery life by observing if numeric display flashes once per second.

4.3.3.1 IF battery is low, REPLACE the batteries or device.
5.0 PROCEDURE

5.1 Using the Nonin/Onyx Vantage 9590 Finger Pulse Oximeter

NOTE - The following may interfere with proper operation or obtaining readings:
- Electromagnetic interference
- Bright light can interfere with readings or make the display difficult to read. Do not use in direct sunlight
- Nail polish and coatings may interfere with readings.

5.1.1 IF there are any questions or concerns on potential interferences, CONTACT the Project Industrial Hygienist prior to taking a reading.

NOTE - Readings may be taken directly on a finger or through a single layer surgical glove if a prior test has been conducted to validate there is no interference.

5.1.2 DO NOT PRESS the device against any surface while the device is on the finger AND

DO NOT SQUEEZE or hold it together (The internal spring provides the correct pressure and any additional pressure may cause inaccurate readings).

5.1.3 ENSURE the device is kept at the worker’s heart or chest level.

CAUTION

Overextending the devices spring may cause damage to the device.

NOTE - A resting pulse rate is obtained prior to beginning work and donning personal protective equipment clothing.

5.1.4 PRIOR to work, OBTAIN a resting pulse rate by centering the worker’s finger (nail-side up) into the meter until the fingertip touches the built-in stop guide.

5.1.4.1 IF the device does not turn on, REMOVE from the finger AND WAIT a few seconds before reinserting it.

5.1.4.2 DURING the start-up sequence, CONFIRM that LED’s ILLUMINATE.
Physiological Monitor with the Nonin Onyx and Vantage 9590

5.1 Using the Nonin/Onyx Vantage 9590 Finger Pulse Oximeter (Cont.)

5.1.5 ENSURE the finger is lying flat (not on its side), is still and is centered in the meter.

5.1.5.1 IF the LED blinks yellow or red, REPOSITION the finger, OR

TRY another finger.

NOTE – A green, continuous LED indicates a good pulse reading. Yellow LED indicates a marginal pulse signal and red, an inadequate signal. Only the green LED indicator readings should be used for recording heart rate.

5.1.6 READ the pulse rate (“heart” icon) AND

RECORD the resting pulse rate on Form A-6006-433.

5.1.7 REMOVE the finger and the meter will automatically shut down.

5.1.8 FOLLOW TFC-ESHQ-S_IH-C-07, “Heat Stress Control” to apply the pulse rate measurement.

5.1.9 PERIODICALLY MEASURE the worker’s pulse rate during the work cycle by repeating Steps 5.1.4 through 5.1.8 on a frequency indicated by form A-6006-433 or at the direction of the Project Industrial Hygienist.  

NOTE - The display will go blank after 10 seconds of no readings.

5.1.10 IF a recovery heart rate is measured, FOLLOW the step in form A-6006-433 for comparison and TFC-ESHQ-S_IH-C-07 to apply it.

5.1.11 RECORD the time the work ended and when the reading occurred for the recovery heart rate.

5.1.12 WITHIN 2 working days, PROVIDE the completed monitoring forms and associated field records to the Project Industrial Hygienist.
5.2 Records

5.2.1 **PERFORM** the following for records identified within this procedure.

5.2.1.1 **RECORD** the number of times the record was generated in applicable column

**OR**

**PLACE** a check mark (✓) in the N/A column.

5.2.1.2 **SUBMIT** the package to IH.

<table>
<thead>
<tr>
<th>Records Submittal Checklist</th>
<th>Number of times completed</th>
<th>N/A (✓)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FORMS</strong> (These records are Official Use Only (OUO))</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial Hygiene surveys (including forms)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SEND</strong> the completed records with Records Submittal Checklist attached to the Safety and Health Program for records retention.</td>
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[Signature] / [Print (First & Last)] / [Date]

IH

The record custodian identified in the Company Level Records Inventory and Disposition Schedule (RIDS) is responsible for record retention in accordance with TFC-BSM-IRM_DC-C-02.