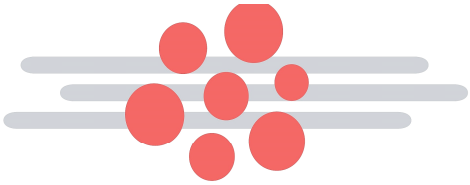


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 <p>Center for Functional Nanomaterials Brookhaven National Laboratory</p>	NUMBER CFN-OPS-SOP-1	REVISION 0
	DATE 4/15/08	PAGE 1 OF 10
SUBJECT: Format of CFN Operational Procedures	PREPARED BY: S. Hoey	
	APPROVED BY: E. Mendez	

1.0 Purpose

This procedure describes the development and format of CFN Department operating procedures related to CFN Environmental, Safety, Security, Health and Quality documents contained within the CFN Operations page.

2.0 Responsibilities

2.1 Authors of CFN operating procedures shall follow this procedure for formatting purposes.

2.2 Authors of CFN policies, programs or procedure appendices may either use the formatting requirements outlined in this procedure, or format the documents so that information is clear and understandable.

3.0 Prerequisites

None

4.0 Precautions

None

5.0 Procedures

Note:

When writing the procedure, avoid using the word “should”. In order to be certain that there is no misunderstanding within CFN, “should” and “shall” are intended to be equivalent words when used in a CFN procedure.

5.1 General page layout requirements – See template attachment

5.1.1 Title Page

- Indicate a title and a CFN number (Obtain unique number from the ESH Coordinator)
- Indicate the number of pages
- Indicate the approval authority (e.g., Department Chair, ESH Coordinator), and date of approval.
- Indicate the author's name (Prepared By).

5.1.2 Footers

- Bottom left of every page shall indicate CFN procedure number.
- To the right of the CFN procedure number, indicate revision number, using “0” for a new procedure.
- Under the revision number, indicate the (final) date written.
- Center the page number on all pages.

5.1.3 Use bullets (•) for lists.

5.1.4 Indent sub-sections

5.2 The arrangement or layout of the procedure shall include the eight major sections defined below. Number each section with Arabic numerals. If there is no information below the heading, indicate "None".

1. Purpose
2. Responsibilities
3. Prerequisites
4. Precautions
5. Procedure
6. Documentation
7. References
8. Attachments

5.2.1 Under **Purpose**, clearly and concisely state the purpose and scope of the procedure.

5.2.2 Under the **Responsibilities** heading, indicate the persons responsible to perform the procedure, and indicate if they are to complete any

documentation. Specify delegation of authority, when necessary.

5.2.3 Under the **Prerequisites** heading, clearly indicate the training programs and required reading which must be completed by the responsible persons before using the procedure.

5.2.4 Under the **Precautions** heading, establish directives to alert the individual performing the procedure of important measures to be taken to protect personnel and equipment, or to avoid an abnormal or emergency condition.

5.2.5 Under the **Procedure** heading, state instructions describing sequential activities in sufficient detail to safely and effectively perform the required function, task, or tests.

5.2.6 Under the **Documentation** heading, list the forms, documents, or specific logbooks, that must be completed, and the person responsible for completing them.

5.2.7 Under the **References** heading, list source documents used in preparation of the procedure and documents referenced in the text.

5.2.8 Under the **Attachments** heading, list items attached to the procedure, which aid in the completion of the procedure, and/or require information or data input. An Attachment can be used as a point of operation "Operator Aid" which is an approved, posted information used to assist personnel in performing a task (e.g., copies of procedures (portion or pages thereof), system drawings, information tags, graphs, prints etc). However, if there is not an associated SOP and the operator aid is stand-alone follow SOP CFN-OPS-SOP-2 for development and approval.

Note:

An Attachment is associated with an SOP, An Operator Aid is typically not associated with an SOP and is "stand alone". SOP-CFN-OPS-2 should be followed when developing stand-alone operator aids.

5.2.8.1 When developing attachments, the following should be considered.

- Attachments which provide information/clarification, should appear as attachments to the body of the SOP, e.g. drawings, maps, figures, memos.

- Attachments which require information or data input, or may require frequent updates, should be written as separate documents, e.g. checklists, forms, lists of personnel.

5.2.8.2 DO NOT list procedure requirements in attachments.

5.2.8.3 Sequentially number attachments in the order in which the attachments appear in the procedure.

5.2.8.3.1 When listing attachment in Section 8, use the following protocol:

8.1 Attachment 1 "Title" - this document is part of the procedure.

8.2 Attachment 2 "Title" - this document is part of the procedure.

8.3 CFN-SOP-ATT "Title" - this will be a separate document

5.2.8.4 Provide a separate title, as specified in section 5.1.1, page for each separate attachment using a separate approval signature, attachment number, and revision number.

• Number the attachment using CFN-SOP-ATT, followed by CFN-SOP number from which the attachment was derived, followed by a decimal point and a lower case letter (e.g., CFN-SOP-ATT-1.4.1.a).

Indicate a listing on the attachment title page that refers to the applicable CFN-SOP procedures. For example:

THIS ATTACHMENT APPLIES TO THE FOLLOWING PROCEDURES:

- CFN-SOP 1.4.1
- CFN-SOP 1.4.2
- CFN-SOP 1.4.3

The footer of each page of the attachment shall be as defined in section 5.1.2.

5.3 Using Warnings, Cautions, and Notes

5.3.1 Place Cautions or Warnings immediately before (text-centered) the procedural content to which they apply.

5.3.2 Do not use a Caution or Warning in lieu of an instructional step.

5.3.3 Use Warning where loss of life, significant personnel injury, significant hazard may exist.

5.3.4 State the consequence of not heeding the Warning.

5.3.5 Use Caution where equipment or environmental damage may occur if an instruction step is not followed verbatim.

5.3.6 State the consequence of not heeding the Caution.

5.3.7 Emphasize the words Caution or Warning by capitalization.

5.3.8 Box or border the Caution or Warning as follows:

<p>CAUTION: Turn off the machine during this specific operation or vacuum will be lost.</p>
--

5.3.9 Avoid embedding commands in Warnings or Cautions.

5.3.10 Use **Notes** to draw attention to important supplemental information.

5.3.11 Box **Notes**, and number multiple Notes, Warnings, or Cautions, as follows:

<p>Note 1: The following step closes generator breaker G-1 and starts diesel DL-1.</p>

<p>Note 2: The following step requires a time measurement starting at the Initiation signal</p>
--

5.4 Using Conditional Steps

5.4.1 Use GO TO, RETURN TO and REFER TO as phrases for routing the reader to different steps.

5.4.2 Convert action steps that branch, such as GO TO, to flow charts whenever appropriate.

5.4.3 Use the IF and THEN for conditional steps. For example:

5.4.3.1 IF branching may increase the potential for confusing the reader, THEN use a flow chart.

5.4.4 Emphasize the words GO TO, IF, THEN, ONLY, DO NOT, REFER TO, RETURN TO, by capitalization.

5.5 Using Forms, Checklists, Maps and Figures

Note 1:

If the procedure is NOT intended to become a record, then the check off lines in the procedure are for place keeping purposes only. The steps in the procedure shall not be signed or initialed.

An entry in the appropriate log shall be the objective evidence that the steps outlined in the procedure have been completed.

Note 2:

Those checklists that have been designated as “Continuous-Use-Checklists” by the CFN Operations Manager shall be annotated with the following caution statement at the top of each page:

Caution:

This is a Continuous-Use-Checklist.

As each step is completed it shall be initialed/signed by the responsible individual prior to initiating the next Step.

5.5.1 Use forms, or checklists, to record the procedural process.

5.5.1.1 Use run-in forms; that is, forms within the procedure, to establish a record of crucial actions.

5.5.1.2 Construct full-page forms for use in conjunction with the procedure.

5.5.2 Logically sort steps and use a checklist whenever appropriate. For example:

5.5.2.1 Perform an autostart of the emergency bearing oil pump by completing the following:

1. Depress EMERGENCY BEARING OIL PUMP TEST SWITCH A _____
2. Observe that the red light goes on _____
3. Turn EMERGENCY SWITCH 2 to STOP _____

5.5.3 Use maps and figures that enhance detail and understanding of the task.

6.0 Documentation

None

7.0 References

SBMS Subject Area "Internal Controlled Documents
DOE-STD-1043 Guide to Good Practices for Operator Aid Postings

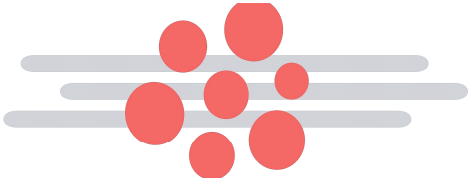
8.0 Attachments

Attachment 1 CFN SOP Template
Attachment 2 Example of an Attachment

Attachment 1 – CFN SOP Template, this is part of CFN-OPS-SOP-1

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	DATE	PAGE 1 OF X
SUBJECT:	PREPARED BY:	
	APPROVED BY:	

1.0 Purpose

2.0 Responsibilities

3.0 Prerequisites

4.0 Precautions

5.0 Procedures

6.0 Documentation

7.0 References

8.0 Attachments

9.0 Implementation and Training

10.0 Documentation

Attachment 2 – Example of Attachment, this is part of CFN-OPS-SOP-1

This Attachment Applies to CFN SOP-NC-2007-ELM-PECVD-1

Prepared by: _____ Approved by: _____ Rev: _____

Gas cylinder change out checklist (printed copies to be kept at gas cabinet site and should be used every time a cylinder change is made)

- Get yourself a buddy.
- Post a sign adjacent to the door to the chase that says “Silane Transfer in process DO NOT ENTER”
- Prop door to service chase open to ease moving gas cylinders in and out of chase.
- Start the “Bottle Change” procedure from the interface of the Trion PECVD unit.
- Both put on PPE: shirt, gloves, and face shield.
- Verify that the exhaust is flowing by observing the tell-tale in the exhaust port.
- The system will prompt you to close the hand valve on top of the cylinder. Close the valve using the access port of the gas cabinet. Do not open the gas cabinet door to turn valves on or off.
- Verify on system that the valve has been closed. The chamber is pumped out to its base vacuum level.
- The purge/pump cycle is repeated 5 times. The line is then maintained under positive nitrogen pressure.
- Bring the gas cart to the gas cabinet.
- Verify that all valves are closed.
- When prompted by the software, disconnect the empty cylinder. Hang regulator on hook in cabinet. Remember the regulator CGA fitting has a left-hand thread.
- Replace the threaded outlet cap in the cylinder valve and replace the cap over the cylinder valve.
- Unfasten cylinder from bracket. Move empty cylinder to cart and chain closed.
- Wheel cart to holding area. Move empty cylinder to rack.
- With the new cylinder secured to rack, remove cylinder cap and inspect for damage or leaks. A leak may manifest itself with some glassy dust (silicon dioxide) near the valves.
- Replace the cylinder cap, remove the cylinder from the storage rack, and secure to the cylinder cart.
- Carefully wheel full cylinder back into chase area. Move cylinder into place inside the gas cabinet. Secure cylinder in place in the cabinet.
- Unscrew cap from cylinder. Carefully inspect for any signs of distress, powder/residue, discoloring or other damage.
- Before connecting the new cylinder, clean the regulator valve off with isopropanol and clean wipe to remove any particles.
- Slowly remove any plug and lock wire and carefully attach cylinder to gas line while keeping main cylinder valve closed.

- Inspect the gas cylinder and connections to make sure everything is satisfactory. Both people should agree that it is OK to proceed.
- Make sure that the door to the gas cabinet and the view port are securely closed.
- Acknowledge on the Trion unit that the cylinder has been changed.
- The pump/purge routine is repeated again 5 times.
- If the MFC does not go to zero, it is an indication of a loose fitting or a leak of some sort. At this point the system will abort and all valves will close. Confirm that everything is satisfactory. If at any step a leak or bad connection is suspected, make one attempt to disconnect and reattach the bottle. If this does not fix the problem, do not try again – more involved leak checking is required.
- When the cycling is complete and the unit tells you to, open the manual valve on the cylinder *through the viewport*.
- PPE can now be removed.
- Record the date of the cylinder change on the log.