

*Handwritten initials*

## Roldan, Lizette

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**From:** Peter Farina [pfarina@isu.edu]  
**Sent:** Tuesday, July 03, 2012 3:06 PM  
**To:** Roldan, Lizette; Torres, RobertoJ  
**Subject:** Information and responses to todays questions

Dear Dr. Roldan,

I am providing more information regarding materials handling, emergency procedures and exposure controls related to item 2 in the amendment request of May 18th. Please contact me if you need more information or if I can be of further assistance.

Thank you so much.

### Handling Procedures

#### From the UO2 procedure:

2. A UO2 charge will be loaded into the crucible. This will be conducted in a glove box at negative pressure inerted with nitrogen or argon.
  - a. The charge will be removed from it's shipping container in the glove box and carefully transferred into the crucible. A typical charge will consist of uranium dioxide in either a powdered or sintered single pellet form.
  - b. The charge is loaded into the crucible and sealed.
  - c. The crucible is then transferred to the load lock of the glove box and a series of contamination smears is conducted and counted prior to removal. If the crucible is externally contaminated, it is deconned inside the glove box prior to removal.

### Fire Protection

The area has passed inspection by the Idaho Department of Building Safety and the Pocatello Fire Chief. The glovebox will contain a 100% nitrogen atmosphere. All handling of powders will take place under the inert atmosphere. The glovebox will also have an inert gas extinguishing system. The radioactive materials storage area will have a fire suppression system.

### Emergency Procedures

#### University General Procedure:

"Idaho State University Radiation Safety Policy Manual Rev. 8", §19, page 49

#### RISE Specific General Procedure:

- a. Loss of containment
  - i. Evacuate.
  - ii. Monitor personnel for contamination using criteria set forth in the Idaho State University Radiation Safety Policy Manual. Decontaminate personnel if any contamination is found.
  - iii. Evaluate the event.
  - iv. Return loose product to a sealed environment.

- v. Remediate any contamination.
- b. Fire
- i. Evacuate the building.
  - ii. Call the fire department.
  - iii. Monitor personnel for contamination. Decontaminate personnel if any contamination is found.
  - iv. Evaluate the event
  - v. Assist the fire department in suppressing the fire.
  - vi. Assess extent of contamination. If possible, return loose product to a sealed environment.
  - vii. Remediate any contamination found in levels in excess of those set forth in the Idaho State University Radiation Safety Policy Manual..

## **Crystal Project Specific Emergency Procedures**

### **Bulk Crystal Growth Project Emergency Shutdown Procedure**

In the event of an emergency:

1. Press emergency shutdown switch on induction power supply
2. Contact an authorized supervisor on the call list attached to the unit
3. Monitor the chamber pressure and temperature on the system readouts
4. Once the unit has reached a safe temperature (<50C) isolate the chamber by shutting the solenoid valves on the overpressure gas system
5. Leave the system open to offgas recovery system and leave nitrogen flowing through the pressure vessel
6. Document the event in the log book

In the event of a power loss:

1. Do not reset the induction power supply
2. Contact an authorized supervisor on the call list attached to the unit
3. Monitor the chamber pressure and temperature on the system readouts
4. Once the unit has reached a safe temperature (<50C) isolate the chamber by shutting the solenoid valves on the overpressure gas system
5. Leave the system open to offgas recovery system and leave nitrogen flowing through the pressure vessel
6. Document the event in the log book

### **Crystal Growth MOCVD**

#### **Emergency Shutdown Procedure**

In the event of an emergency:

1. Press emergency shutdown switch on main power supply
2. Contact an authorized supervisor on the call list attached to the unit
3. Monitor the chamber pressure and temperature on the system readouts
4. Once the unit has reached a safe temperature (<50C) isolate the chamber by shutting the solenoid valves on the overpressure gas system
5. Leave the system open to offgas recovery system and leave nitrogen flowing through the

pressure vessel

6. Document the event in the log book

In the event of a power loss:

1. Do not reset the main power supply
2. Contact an authorized supervisor on the call list attached to the unit
3. Monitor the chamber pressure and temperature on the system readouts on the main controller computer
4. Once the unit has reached a safe temperature (<50C) isolate the chamber by shutting the solenoid valves on the overpressure gas system
5. Leave the system open to offgas recovery system and leave nitrogen flowing through the pressure vessel
6. Document the event in the log book

## **Exposure control**

- A. Inhalation monitoring:

### **University General Policy:**

“Idaho State University Radiation Safety Policy Manual - Rev. 8 ”, §11.2, page 39

A Uranium specific monitoring and assessment procedure is currently under development by the TSO to be in compliance with both the NRC and OSHA regarding worker protection.

Exposures will be assessed both in terms of radiological dose and chemical exposure.

### **RISE Specific Monitoring:**

“Fuel Performance Experiments on the Atomistic Level, Studying Fuel Through Engineered Single Crystal UO<sub>2</sub>” page 3

- B. Bioassays

### **University General Policy:**

“Idaho State University Radiation Safety Policy Manual - Rev. 8 ”, §11.3, page 39

- C. Contamination Control

### **University General Policy:**

“Idaho State University Radiation Safety Policy Manual - Rev. 8 ”, §11.3, page 32 - 38

### **RISE Specific Monitoring:**

“Fuel Performance Experiments on the Atomistic Level, Studying Fuel Through Engineered Single Crystal UO<sub>2</sub>” pages 2-3

## **Crystal Project Specific**

“Crystal Growth Furnace Fuel Performance Experiments on the Atomistic Level, Studying Fuel Through Engineered Single Crystal UO<sub>2</sub>,” pages 7-9,

D. Exposure to the Public Controls

**University General Policies and Procedures:**

“Idaho State University Radiation Safety Policy Manual - Rev. 8 ”, §6, page 20-21

Procedure Number TSO-08-10-Rev 1, “National Emission Standards for Hazardous Air Pollutants for Radionuclides (Rad NESHAPs)”

Procedure Number: TSO-08-01-REV 1, “100 mrem Report”

**RISE Specific Alpha Effluent Monitoring:**

“Crystal Growth Furnace Fuel Performance Experiments on the Atomistic Level, Studying Fuel Through Engineered Single Crystal UO<sub>2</sub>,” page 3,