OHMART VEGA

Ohmart/VEGA Corporation
4241 Allendorf Drive
Cincinnati, Ohio 45209-9961
USA

(800) FOR LEVEL Toll-Free in USA & Canada
(513) 272. 0131 Telephone
(513) 272. 0133 FAX

http://www.ohmartvega.com URL
info@ohmartvega.com E-mail

April 7, 2006

Mr. John D. Kinneman, Chief
Materials Security and Industrial Branch
Division of Nuclear Materials Safety
U.S. Nuclear Regulatory Commission
Region 1
475 Allendale Rd.
King of Prussia, PA 19406-1415

Ref: Inspection No. 03031956/2005002 37-28586-01
Docket No. 03031956
Licensee: Epsilon Products Company

Dear Mr. Kinneman:

We have reviewed the Inspection Report on the above mentioned issue, and hereby request that the following clarifications be introduced into the record:

Item III. Follow up of the event by NRC

Observations and Findings:

a. The Certified Health Physicist who was retained by Epsilon did not have the equipment necessary to ascertain the actual radiological surveys. The CHP told David Brink of Ohmart/Vega that his meter "pegged" at 2 R/hr, so he did not get accurate readings in any area where the field was greater than 2 R/hr. Survey information which indicates exposure rates as high as 5 R/hr would have been conducted by Mr. Brink. Actually, Mr. Brink's records indicated readings approaching 6R/hr.

b. The statement "The gauge does not have indicators to show if the source is in the shielded position" is incorrect. Indicators are present on the gauge: they are engraved on the operating plate and state "open" & "closed".

c. In the final paragraph on page 3, the statement "He did not notice that the shutter was locked in the closed position" is incorrect. The shutter cannot be locked in the closed position unless the carrier is fully retracted into the body of the source holder. In addition, when Mr. Brink arrived, he noticed that there was no lock on

the device. Mr. Brink provided the lock after retracting the source into the source holder.

d. Again, in the final paragraph on page 3, the statement "Individual A then surveyed around the reactor on the 4th level and did not notice any radiation levels that were significantly above background" is misleading. Since it has been demonstrated that there were radiation levels above background in the area, either the survey was not done or it was not done correctly.

e. In the second paragraph on page 4, the statement "The cable pulled out of the source holder without any difficulty, indicating that the source <carrier> had separated from the cable" is incorrect. The cable and carrier are swaged together in four places, and it would take a great deal of force to pull them apart.

f. In the third paragraph on page 4, the statement "The results of these surveys indicated that the source was lodged in the guide tube outside the gauge" is incorrect. The source was never "lodged" – it was free moving at all times.

g. In the final paragraph on page 5, it is stated that "the highest dose rate inside the reactor vessel was about 60 millirem per hour." This reading may have been the common point rate (in the middle of the vessel), but the highest point (on the surface of the wall) showed a reading of 1R/hr. when surveyed by Ohmart/Vega.

Item IV: Inspector's Discussion with Ohmart Corporation

Observations and Findings:

a. In the final paragraph, it is stated that "The shutter handle does not have a positive physical component to prevent the rotor from drifting to the closed position during operation or when attempting to retract the source carrier." This statement is misleading, as it indicates a design defect. In fact, the spring loaded set pin which is part of the shutter mechanism prevents the rotor from drifting. As noted earlier in the report, the set pin was missing from this gauge.

We are also enclosing our report to the Ohio Department of Health on this incident, and we would appreciate this report being made part of the final record.

Thank you for your assistance.

Sincerely,

Mark A. Cornelissen

Mark A. Cornelissen
Radiation Safety Officer

OHMART VEGA

Ohmart/VEGA Corporation
4241 Allendorf Drive
Cincinnati, Ohio 45209-9961
USA

(800) FOR LEVEL Toll-Free in USA & Canada
(513) 272. 0131 Telephone
(513) 272. 0133 FAX

http://www.ohmartvega.com URL
info@ohmartvega.com E-mail

Service Report for Epsilon Products-Marcus Hook, PA
August 27 and 28, 2005.

At approximately 1:30 a.m. on Saturday August 27th, I received a phone call from Wayne Applegate, Radiation Safety Officer at Epsilon Products. Mr. Applegate explained that his personnel had discovered that a 1200 mCi, Cs-137 source, serial number M-4695, had not been fully retracted into an Ohmart source holder model SHLM-CR-3 during a planned maintenance shutdown of the #2 Chunk Reactor. Mr. Applegate's first indication came late Friday evening, though the lock out and subsequent maintenance in the vessel occurred from Sunday the 21st and throughout the week. It was his belief that the cable had been disconnected from the source resulting in the source not being fully retracted. I then advised Mr. Applegate to gather records of the lock out/tag out and work permits as an attempt to identify personnel who would have been in the unrestricted area during the week. The only data that Mr. Applegate could provide was that fields were measured at about 600mR/hr near the source holder by his personnel and survey meter. Subsequently, I directed Mr. Applegate to restrict access by establishing a restricted area at 2mR/hr and to notify the Nuclear Regulatory Commission. A boundary had already been established but radiation fields were checked again to verify the 2mR/hr limit. Mr. Applegate then requested help from Ohmart/VEGA Corp., in order to assist them with the recovery of the capsule. I then contacted Candy Brock, Customer Support Manager, and David Brink, Nuclear Services Specialist with the plan being for David to travel to the facility and support Mr. Applegate in any way possible.

Upon arrival at the site David met with Mr. Applegate (RSO), Margarite Moreno, Sunoco Chemical Manager of HES and Management Systems, and Tony LaMastra, Health Physics Associate. All were in a meeting in the control room talking to Epsilon's employees regarding the incident with the source holder. Upon conclusion of the meeting in the control room, another meeting was scheduled and was attended by Mrs. Moreno, Mr. LaMastra, Theresa Turnbach(Senior Process Engineer), Ray Thropp(Maintenance Manager), Mr. Applegate, and David. The goal was to develop an action plan to retract the source carrier back into the source holder since this was causing a delay in Epsilon's maintenance schedule. David expressed an interest in verifying Mr. LaMastra's survey numbers since he mentioned that his meter had exceeded full range at 2 R/Hr during his survey. David was allowed to go up to the vessel with Mr. LaMastra since they were the only people with any type of personnel dosimetry. With an Eberline E-600 David found fields of 1-2 R/hr at the wall closest to the source holder inside the vessel and 5-6 R/hr outside the vessel near the source holder. David expressed an urgent need to

shield the field down to more acceptable levels to maintain ALARA. A difficulty arose in locating shielding (lead) on such a short notice. Epsilon personnel were eager to continue efforts in retracting the capsule but David mentioned he was not comfortable performing any work around the source holder with the radiation fields that high. It was understood that efforts were to continue through the night in locating lead shielding with arrangements to be made to ship available shielding materials from Ohmart/VEGA Corp. if shielding could not be found locally.

Upon David's return the next morning, lead blankets had been found locally and a shipment of supplies from Ohmart/VEGA Corp. was also on its way. A plan was developed to enter the vessel from above the affected area, cut a hole in the well, and insert ¼ inch tubing into the well as an attempt to push the source back into the SHLM-CR-3. Radiation levels in the vessel were verified to be in the μR/hr range which allowed their worker, Allen Smith, and David Brink to enter the vessel. Constant monitoring via a survey meter was performed and Allen wore two pocket dosimeters provided by David Brink. The attempt was successful - the source had been pushed back into the source holder and was verified by the lack of radiation fields. The pocket dosimeters showed no change from their initial reading indicating no reason to expect Mr. Smith received any appreciable dose. David's electronic dosimeter revealed a change of only 2.5 mRem since his arrival. The source holder was removed from the vessel and prepared for shipment back to Ohmart/VEGA Corp. for evaluation. All surveys of the source holder were at expected levels. David did perform an output check of the source holder and resurveyed the vessel as an extra precaution to make absolutely sure the source was in the holder. Mr. Applegate then notified the NRC that the source had been retracted. I stated that a full investigation and evaluation surrounding the separation of the source carrier from the cable would be performed when the holder arrived back at Ohmart/VEGA Corp.

The SHLM-CR-3 arrived on Friday, September 2nd at our source handling facility. After receiving the source, David and I moved the holder into the disposal room for analysis. I took numerous pictures of the exterior and interior components of the source holder and removed the capsule and carrier from the holder to another shielded container. The cable used to retract and insert the source carrier did not get shipped back with the holder. Larry Hayes, Manufacturing Process Manager, and Greg Burton, Nuclear Mechanical Assembler, was also present for the evaluation. After evaluating the photos and inspecting the source holder from Epsilon, I have made the following conclusions:

The spring pin in the shutter mechanism is missing - the shutter handle is bent and has been filed upon. The shutter handle does not have a positive physical component to prevent the rotor from drifting to the closed position during operation or when attempting to retract the source carrier. Evidence of the source carrier hitting the face of the mounting flange, internal housing and rotor are all evident from the photos. It appears that the damage was accomplished when the rotor drifted closed forcing the cable to the side wall and thereby causing the carrier to hit

each of these components. With the rotor partially closed, there was not adequate clearance for the source carrier to be retracted through the rotor and into the holder. It is then believed that Epsilon personnel used excessive force on the cable in order to retract the capsule back into its container. This is when the cable became disconnected from the swaged carrier fitting.

It is my belief that the damaged shutter handle, lack of training and unfamiliarity with this source holder proved to be the main reason for its failure and not due to design error. Evidence to support this claim is present. The first such error occurred in having an untrained technician perform the subsequent survey to verify the lock out/tag out procedure and then did not provide any documentation showing its completion. Second, if any difficulty was experienced in retracting the source, a thorough survey should have been performed and documented. This was not accomplished. It is also still unclear to what level of difficulty Epsilon's technicians were having in retracting the source and by what means they were using to get the shutter closed. From the appearance of the cable as seen by David Brink, it appears the carrier and cable were pulled apart from the four swage fittings and not sheared. The amount of force required to do this is most likely beyond any one man's strength, therefore it is likely that some sort of mechanical leverage was used. If the shutter was not held in the full open position, then it is possible to retract the cable, but nearly impossible to retract the carrier into the source holder. Again this stems from the unfamiliarity and lack of training of Epsilon personnel and not due to any assembly error of the source holder.

Mark A. Cornelissen
Radiation Safety Officer