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NASA

National
Aeronautics and
Space
Administration

Reply to Attn of: SM31 August 9, 1978

MEMORANDUM FOR RECORD

FROM: SM31/J. J. Wood

SUBJECT: Sodium Vapor Lighting Safety

Recently a question has arisen as to the safety of sodium vapor lighting and more particularly as regards to the fire and/or explosion potential of low pressure sodium (LPS) vapor lamps that may be broken accidentally or otherwise in water. At the MAF, although not yet completed, high pressure sodium vapor lights are being installed in Building 103 and low pressure sodium vapor lights have been installed in the parking lots.

As regards to fire/explosion and personnel hazards potential the following is offered:

1. G. E. Brochure – "Low-Pressure vs. High Pressure Sodium", an eight page sales brochure. The seventh page under, Easy Disposal, implies that the disposal of low pressure sodium lamps is a greater problem than for high pressure. It is to be noted that this brochure does not identify any specific hazards associated with low pressure lamps. An attempt to get safety information via the toll free number listed on the last page was unsuccessful.

2. Article, "Roadway Lighting Systems – Lucalox (HPS) vs. Low Pressure Sodium (LPS)". This article marked, <u>For General Electric Employees Only</u> appears to be a training article presented at the General Electric Training Institute and deals primarily with comparisons of efficiency and the economics of high vs. low pressure sodium vapor lights. Under Safety of Low Pressure Lamps, Page 9, the article indicates that a low pressure sodium vapor lamp which arrived with the outer jacket broken was disposed of in accordance with the manufacturer's instructions and that the results were rather impressive. It states that a loud bang occurred and that flames appeared three different times. G. E. (in 1976) indicates that when customers are made aware of the disposal problem with low pressure sodium vapor lights the general feeling is that their use is not worth the risk involved.

3. QL Inc. Letter dated 7/17/78 and attached Environmental Research Laboratories test report indicates the hazards involved with low pressure sodium vapor lights is no greater than that that of other lamps such as high pressure sodium vapor or mercury vapor lights.

4. Article “The Disposal of Electric Discharge Lamps”, from Lighting, Design and Application dated March 1977. Article indicates that there are hazards involved in most HID lamps particularly in their handling and disposal due to cuts from glass, contact with material coatings, implosions, etc. It points out that care must be exercised in the application and disposal of many types of lamps in use today. A safe method of disposal of LPS lamps is outlined.

5. U. S. Consumer Product Safety Commission (CPS) – An inquiry was made to the U. S. CPS regarding any known or reported hazards involving sodium vapor lamps. The CPS is not aware of any, however, they have issued hazard warnings on other lamps.

6. Occupational Safety and Health Administration – An inquiry was made to the local OSHA area office on 7/20/78 regarding safety hazards of sodium vapor lights. Consultation with two of their industrial hygienists Rebecca Scholl and Carl Grose, revealed no alerts or hazard notices concerning these lamps. They indicated that they could think of no unusual safety hazards with sodium vapor lamps significantly different or greater than that involving other lamps.

7. Federal Highway Administration – A call was made to Mr. John Arens, Street and Highway Lighting Branch, Office of Traffic Operations, Fed. Highway Adminis., Washington, D.C. 20590, PH.: (202) 426-0411. Inquiry was made as regards to hazards experience with sodium vapor lights on the U.S. Highway system. Mr. Arens said that while there was not a formal hazards reporting system in the FHWA he was sure that if there had been any safety problems with sodium vapor lighting, his office would be aware of it. He was [not] aware of any. He stated that, starting last year, the Federal Government has a program whereby the States are reimbursed 90% of their costs of converting from mercury vapor to sodium vapor lighting. He stated that while high pressure sodium vapor is preferred, for economic and technical reasons, low pressure sodium vapor lights are also approved. He stated, low pressure sodium vapor lights had been in operation along a one mile stretch of an Interstate Highway in Illinois since 1972, a tunnel in Philadelphia, since 1974 and in an ERDA parking lot in Germantown, Md. since August 1977.

8. MAF Experience – During installation of lamps at MAF two employees had sodium spilled on their hands and arms due to a broken lamp when installing LPS lights in Parking Lots. The material was washed away with soap and water which was confirmed by cognizant medical and industrial hygienist personnel as having been the most appropriate action to have taken. There were no injuries, no rash, no after effects, from this accident.

CONCLUSION: Based on the above reviews of available data, discussion with others with considerable experience in the application and use of sodium vapor lighting, as well as the MAF direct experience, my conclusion is that sodium vapor lights can be utilized safely with hazards no greater than those which exist for other types of electric discharge lamps when handled in accordance with the manufacturer's instructions.

/signed/
Jewel J. Wood
Facility Operations Office

Attachments:

1. G. E. Brochure, Low P-Pressure vs. High P-Pressure Sodium.
2. Article, "Roadway Lighting Systems – Lucalox vs. Low Pressure Sodium (LPS)" by General Electric.
3. QL Inc. letter, dated 7/17/78 and attached Environmental Research Laboratories Test Report.
4. Article "The Disposal of Electric Discharge Lamps" from Lighting Design and Application, dated March 1977.
5. U. S. Consumer Product Safety Commission Letter dated 7/20/78.

cc:
SM31/J. Demarest (without encl.)
AB01/C. Adams (with encl.)
BSI/C. Freeman (w/o encl.)
MMC/Earl McNail (w/o encl.)
CS21/M. Dorman (with encl.)

Transcribed from photocopy 11 June 2003 by Christian B. Luginbuhl, U.S. Naval Observatory Flagstaff Station.