the **Federal Register** calling attention to four new technologies that are being or will be used in signal lamps and headlamps subject to Standard No. 108 (59 FR 16788). These new signal lamp technologies are light-emitting diodes (LEDs), miniature halogen bulbs, long arc discharge bulb systems (e.g., neon and other gas filled tubular lamps), and short arc discharge bulb systems. The notice noted that it is likely that the latter will be used in headlamps, too.

Twenty-five comments were received in response to the notice. Among those who commented were Ford Motor Company, General Motors Corporation (GM), American Automobile Manufacturers Association (AAMA), Koito Manufacturing Co. Ltd., Hewlett-Packard, Hella KG Hueck & Co. (Hella), Volkswagen of America (VWoA), General Electric Company (GE), OSRAM Sylvania, Inc. (OSRAM), Stanley Electric Co. Ltd. (Stanley), and State Farm Insurance.

On the basis of the comments received, NHTSA has decided to initiate rulemaking that would amend Standard No. 108 so as to allow replaceable bulb headlamps to incorporate short arc discharge light sources. It is terminating action on the other lighting technologies for the reasons explained below.

I. Long and Short Arc Discharge Systems

With the thought of developing appropriate amendments to Standard No. 108 to facilitate the introduction of long and short arc discharge technology, NHTSA sought comments on the following:

A. Identification of the performance requirements and/or test procedures specified, or incorporated by reference, in Standard No. 108 that should be modified to accommodate the installation of arc discharge light sources in lamps required by the standard.

B. Specification of the performance requirements and/or test procedures that should be added to Standard No. 108 to accommodate the installation of arc discharge light sources while maintaining the present level of safety achieved by incandescent filament light sources.

C. Identification of any special considerations that should be made to accommodate the concept of a single light source whose light is distributed to the vehicle's lamps by lamp pipes, and an opinion as to whether it is premature to consider regulation of this concept.

D. An opinion of when Standard No. 108 should be amended to accommodate the use of arc light sources in production motor vehicles. These sources are permitted because Standard No. 108 does not specify requirements for signal light sources.

NHTSA received no specific recommendations on how to amend Standard No. 108 to facilitate the use of long arc lighting technology. Some commenters noted that the Society of Automotive Engineers (SAE) is drafting a recommended practice for long arc sources, but estimated that its completion date is well in the future. OSRAM Sylvania commented that it has developed a long arc (neon) Center High Mounted Stop Lamp (CHMSL) that is almost ready for production, and it recommended that NHTSA amend Standard No. 108 to state clearly that long arc sources may be tested *as a system* for compliance with Standard No.108 (which would allow testing with the ballast).

As currently being developed, long arc technology such as neon may be used to provide tail, stop, and turn signal lighting. Long and short arc discharge lamps are similar in some respects. Both require ballasts to transform the 12.8 volt vehicle electrical supply into an output format necessary to operate the discharge tube or bulb. Both operate at voltages substantially higher than the nominal 12.8 volts of a standard automobile battery. The ballast elevates the voltage output of the battery to the level required by the lamp.

NHTSA wishes to assure OSRAM that Standard No. 108 already permits testing of long arc light sources with their ballast. The agency interprets Paragraph S5.1.1.16 as permitting this. This paragraph states:

> S5.1.1.16 A lamp designed to use a type of bulb that has not been assigned a mean spherical candlepower rating by its manufacturer and is not listed in SAE Standard J573d, *Lamp Bulbs and Sealed Units,* December 1968, shall meet the applicable requirements of this standard when used with any bulb of the type specified by the lamp manufacturer, operated at the bulb's design voltage. A lamp that contains a sealed-in bulb shall meet these requirements with the bulb operated at the bulb's design voltage.

While this does not specifically mention long arc light sources with ballasts, the second sentence does address the use of lamps with bulbs that are ''sealed-in'' and those in which they are not. If a long arc lamp is manufactured with the light source and the ballast as a sealed unit (sealed within the lamp), then it would be tested for compliance by application of the design voltage at the lamp leads.

The first sentence of S5.1.1.16 addresses the situation where the ballast is separate from the lamp (not sealed within it) and externally connected to it. A long arc light source is considered a ''bulb'' and would be tested at its manufacturer's specified design voltage.

The allowance of long arc technology for signal lamps may raise issues relating to intensity, headlamp/daytime running lamp spacing, and aspect ratio because this technology may result in unique and creative lamp shapes and design variations that influence the efficacy of signal lamps. For example, Standard No. 108 does not specify an aspect ratio for stop lamps. As an example, although a CHMSL must have an effective projected luminous lens area of not less than 4½ square inches, the requirement can be met by both a rectangular lens of 2 inches by 2½ inches and one of 10 inches by .45 inch because Standard No. 108 contains no limitations on signal lamp length or height.

Because the efficacy of long arc technology for signal lamps is still being researched, NHTSA will propose no changes at this time, and will seek further information on the issues of lamp spacing, effective luminous lens area, aspect ratio between lamps, appropriate photometric requirements, and interchangeability. It may also be necessary to obtain information from manufacturers regarding the operating voltage of an arc lamp source as used on a motor vehicle. This would be for the purpose of providing a source voltage equivalent to the design voltage that is required for compliance testing purposes if NHTSA decided to perform testing without the system's original ballast.

Short arc discharge headlamp systems are commonly referred to as ''high intensity discharge'' (HID) systems. Presently, the only HID application in production for lamps covered by Standard No. 108 is in headlamps, and the only way HID headlamps can be used under the standard is in an ''integral beam headlighting system'' (Section S7.4). Thus, today, HID headlamps are comprised of a headlamp body (including reflector and lens), a small transparent envelope containing a specific mixture of gases under high pressure (the discharge bulb), and an electronic ballast to convert low voltage direct current to a controlled output high voltage direct or alternating current to drive the discharge bulb.

However, by definition (S4), an integral beam headlamp (including those with HID light sources) is one with an ''integral and indivisible optical assembly'', and a headlamp that is ''not a replaceable bulb headlamp * * *.'' In the event of damage to one component, such as the lens, the entire unit, ballast