couples ballast **60** output to the first lamp **62**. When the signal from the sensor **66** falls below a predetermined level, the switch **68** applies the output of the ballast **60** to the second lamp **64**. At the same time, a signal can be sent to the rotator to change to the setting which passes the second lamp **64** illumination.

[**0036**] In an alternative mechanization, the ballast would be nominally connected to the first lamp, for example, and the output current in the ballast would be sensed. If the current dropped to zero (indicating a lamp failure), then the ballast would be automatically disconnected from the first lamp and instead connected to the second lamp (via relays or similar means), and simultaneously the polarization rotator would be automatically set to the inverse rotation from its previous setting, to ensure the net light output remains unchanged.

[**0037**] There are other possible uses for this architecture, where the first and second lamps need not be identical. One such configuration is shown in **FIG. 5**, in which the first lamp **12**" is a high intensity lamp for high ambient daytime viewing (high luminance) and the second lamp **14**" is a low intensity lamp for night viewing (low luminance).

[**0038**] Since the power dissipation of first lamp **12**" would be much lower than for second lamp **14**", this would be a more efficient system than one which merely attenuated the high intensity lamp output for low luminance. Additionally, for military applications the emission from second lamp **14**" (night lamp) could be filtered for NVIS compatibility, if desired, without affecting the broad color gamut of first lamp **12**" in daytime use.

[**0039**] In such applications, the lamps could be powered individually, depending on which one is needed, or they could be powered simultaneously, relying on the selectivity of the polarization rotator and the output polarizer to choose the correct lamp emission. Moreover, for optimum power utilization, the lamps would be used alternatively so that the unneeded night second lamp **14**" would not be powered while the day first lamp **12**" was being operated, and vice versa.

[**0040**] Thus there has been shown a novel utilization of a polarizing beam splitter to selectively enable one of a pair of possible light sources. In one embodiment, the sources are substantially identical and one can be instantly employed if the other ceases to operate. In other embodiments, each source can have different characteristics and the output beam can go from light of one source through light from both sources to light from the other source by adjusting a polarization rotator.

[**0041**] In yet another embodiment, one of the sources may be considered a "day" source and be substantially brighter than the other source which would be considered a "night" source. If NVIS compatibility is desired, appropriate infra red filters could be inserted between the night source and the beam splitter input face.

[**0042**] It should be noted that although the invention has been described as particularly applicable to arc lamps, it is equally applicable to all light sources, including incandescent and fluorescent lamps.

[**0043**] Accordingly, the scope of the invention should only be limited by claims appended below.

1. A dual lamp source for an optical system comprising, in combination:

a polarizing beam splitter having at least first and second input faces and an output face, one of said input faces and said output face being orthogonal to an optical axis, the other of said faces being in a plane parallel to said optical axis;

a first lamp adjacent said one of said input faces for directing illumination along said optical axis, emerging from said output face polarized with a first orientation;

a second lamp adjacent the other of said input faces for directing illumination along said optical axis, emerging from said output face polarized with a second orientation different from said first orientation;

an output polarizer adapted to receive the beams exiting from said output face; and

polarization rotator means interposed between said output face and said output polarizer for changing the orientation of the polarized beam exiting from said output face,

whereby said rotator means, in one configuration, passes polarized beams of said first orientation and blocks polarized beams of said second orientation and in a second configuration, passes polarized beams of said second orientation and blocks polarized beams of said first orientation, the configuration of said rotator means selecting one of said illumination sources to supply illumination to an optical device.

2. The apparatus of claim 1, above, wherein said polarization rotator means include:

half wave plate means for changing the orientation of a polarized beam and

rotational drive means coupled to said plate means for changing the rotational orientation of said plate means whereby operation of said drive means rotates said plate means to rotate the orientation of an applied polarized beam.

3. The apparatus of claim 2, above wherein said half wave plate means have a slow axis and said slow axis is aligned to be at 45° with respect to the first orientation of polarized light.

4. The apparatus of claim 1, above, wherein said polarization rotation means include a liquid crystal device responsive to an applied electrical signal to vary optical retardation from 0° at maximum applied signal to 90° at minimum applied signal.

5. The apparatus of claim 4, above, wherein said liquid crystal device is an untwisted nematic device with its director axis set at 45° to the incoming polarized light.

6. The apparatus of claim 1, above, wherein said polarization rotation means include a liquid crystal device responsive to an applied electrical signal to vary optical retardation from 0° at minimum applied signal to 90° at maximum applied signal.

7. The apparatus of claim 6, above, wherein said liquid crystal device is a twisted nematic device with its director axis set in line with the incoming polarized light.

8. The apparatus of claim 1, above, further including ballast means alternatively connected to said first and second lamps whereby only one of said lamps is operated at any