

LEGEND:                      **Blue = information provided.**                      **Red = table values, etc.**  
                                 **Black = calculated values.**                      **Green = ANSWER**

## Charts and Publications

### Navigation & Position Determination Computations - Luminous Range

USCG 1595-NG-3

STEPS

The Light List indicates that a light has a nominal range of 8 miles and is 48 feet(14.6 meters) high. If the visibility is 6 miles and your height of eye is 35 feet(10.7 meters), at what approximate distance will you sight the light?

SOLUTION:

48 feet above the water  
8 miles nominal range

35 feet - Height of eye  
6.0 miles visibility

The **luminous range** is the maximum distance at which a light can be seen under existing visibility conditions. This luminous range takes no account of the elevation of the light; the observer's height of eye; the curvature of the earth; or interference from background lighting. The luminous range is determined from the known nominal luminous range, called the nominal range, and the existing visibility conditions (using the Luminous Range Diagram).

The **nominal range** is the maximum distance at which a light can be seen in clear weather as defined by the International Visibility Code (meteorological visibility of 10 nautical miles.) The **geographic range** is the maximum distance at which the curvature of the earth permits a light to be seen from a particular height of eye *without* regard to the luminous intensity of the light. The geographic range, sometimes printed on charts or tabulated in light lists, is the maximum distance at which the curvature of the earth permits a light to be seen from a height of eye of 15 feet above the water when the elevation of the light is taken above the height datum of the largest scale chart of the locality.

In predicting the range at which a light can be seen, one should first determine the geographic range to compare this range with the luminous range, if known.

**The lesser of geographic vs luminous range determines the distance the light can be seen.**

The Luminous Range is **6.0 miles**. The Geographic Range is 15.0 miles. **WHICH EVER IS LESS.**

Select the closest answer.

- A) 15.0 nm
- B) 12.4 nm
- C) 8.0 nm
- D) 5.9 nm    ← **ANSWER**

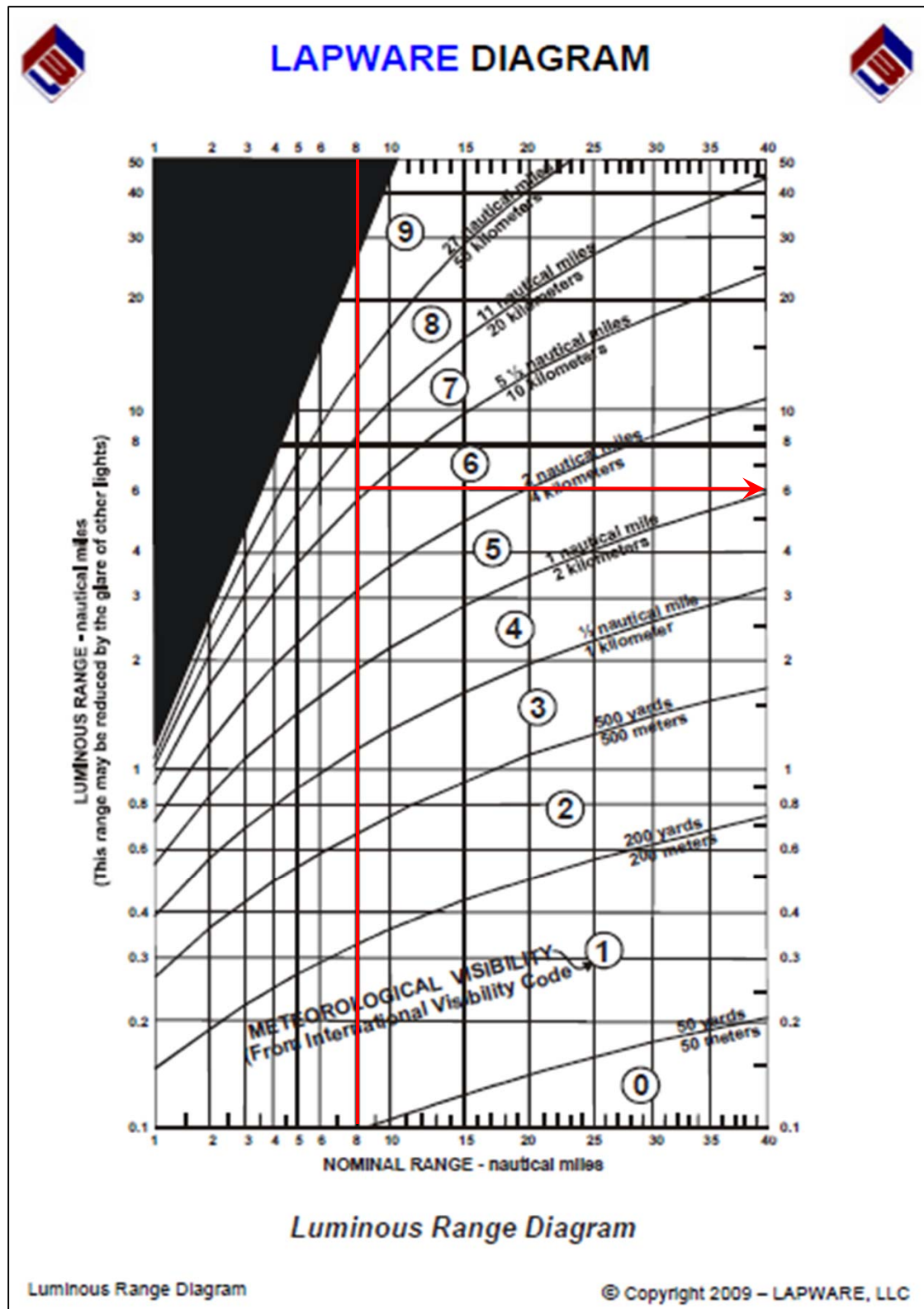
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**6.0 mi.**  
Luminous  
Range

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TABLE 40														
Geographic Range														
Object height		Height of eye of observer in feet and meters										Object height		
Feet		7	10	13	15	20	23	25	30	33	36	Feet		
Meters		2	3	4	5	6	7	8	9	10	11	Meters		
		Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles	Miles			
0	0	3.1	3.7	4.2	4.7	5.2	5.6	6.0	6.4	6.7	7.0	0	0	
3	1	5.1	5.7	6.2	6.7	7.3	7.6	8.0	8.4	8.7	9.0	1	3	
7	2	6.2	6.8	7.3	7.8	8.3	8.7	9.1	9.5	9.8	10.1	2	7	
10	3	6.8	7.4	7.9	8.4	8.9	9.3	9.7	10.1	10.4	10.7	3	10	
13	4	7.3	7.9	8.4	8.9	9.5	9.8	10.2	10.6	10.9	11.2	4	13	
16	5	7.8	8.4	8.9	9.4	9.9	10.3	10.6	11.1	11.4	11.7	5	16	
20	6	8.3	8.9	9.5	9.9	10.5	10.8	11.2	11.6	12.0	12.3	6	20	
23	7	8.7	9.3	9.8	10.3	10.8	11.2	11.6	12.0	12.3	12.6	7	23	
26	8	9.1	9.7	10.2	10.6	11.2	11.6	11.9	12.4	12.7	13.0	8	26	
30	9	9.5	10.1	10.6	11.1	11.6	12.0	12.4	12.8	13.1	13.4	9	30	
33	10	9.8	10.4	10.9	11.4	12.0	12.3	12.7	13.1	13.4	13.7	10	33	
36	11	10.1	10.7	11.2	11.7	12.3	12.6	13.0	13.4	13.7	14.0	11	36	
39	12	10.4	11.0	11.5	12.0	12.5	12.9	13.3	13.7	14.0	14.3	12	39	
43	13	10.8	11.4	11.9	12.4	12.9	13.3	13.6	14.1	14.4	14.7	13	43	
46	14	11.0	11.6	12.2	12.6	13.2	13.5	13.9	14.3	14.7	15.0	14	46	
49	15	11.3	11.9	12.4	12.9	13.4	13.8	14.2	14.6	14.9	15.2	15	49	
52	16	11.6	12.1	12.7	13.1	13.7	14.0	14.4	14.8	15.2	15.5	16	52	
56	17	11.9	12.5	13.0	13.4	14.0	14.4	14.7	15.2	15.5	15.8	17	56	
59	18	12.1	12.7	13.2	13.7	14.2	14.6	15.0	15.4	15.7	16.0	18	59	
62	19	12.3	12.9	13.4	13.9	14.4	14.8	15.2	15.6	15.9	16.2	19	62	
66	20	12.6	13.2	13.7	14.2	14.7	15.1	15.5	15.9	16.2	16.5	20	66	
72	22	13.0	13.6	14.1	14.6	15.2	15.5	15.9	16.3	16.6	16.9	22	72	
79	24	13.5	14.1	14.6	15.1	15.6	16.0	16.4	16.8	17.1	17.4	24	79	
85	26	13.9	14.5	15.0	15.5	16.0	16.4	16.8	17.2	17.5	17.8	26	85	
92	28	14.3	14.9	15.4	15.9	16.5	16.8	17.2	17.6	17.9	18.2	28	92	

	33	35	36
46	14.7	14.9	15.0
48	14.8	15.0	15.1
49	14.9	15.1	15.2

**15.0 mi.**  
Geographic  
Range