Probable Errors of Position

Initial Position Error (X) and Search Craft Position Error (Y) are the estimated errors of position based on navigational accuracy of the distressed craft and the of the search facilities.

If information on the means of navigation used by the distressed craft or by a search facility is available, the navigational fix errors (Fix$_e$) listed in Table N-1 may be used for positions reported as navigation fixes (X = Fix$_e$ or Y = Fix$_e$).

Means of navigation	Fix errors (NM)
GPS	0.1 NM
Radar	1 NM
Visual fix (3 lines)*	1 NM
Celestial fix (3 lines)*	2 NM
Marine radio beacon	4 NM (3-beacon fix)
LORAN C	1 NM
INS	0.5 NM per flight hour without position update
VOR	± 3° arc and 3% of distance or 0.5 NM radius, whichever is greater
TACAN	± 3° arc and 3% of distance or 0.5 NM radius, whichever is greater

* Should be evaluated upward according to circumstances.

Table N-1 – *Navigational fix errors*

If the means of navigation used by the distressed craft or by a search facility is unknown, then Fix$_e$ is equal to:

Type of craft	Fix$_e$
Ships, military submarines, and aircraft with more than two engines	5 NM
Twin-engine aircraft	10 NM
Boats, submersibles, and single-engine aircraft	15 NM

Table N-2 – *Fix errors by craft type*

When the initially reported position of the distressed craft is based on dead reckoning (DR) or the search facility must use DR navigation, an additional error is assumed for the distance travelled since the last fix. The position error is the sum of the fix error (Fix$_e$) plus the DR error (DR$_e$). Table N-3 gives DR$_e$ for various craft.

Type of craft	DR$_e$
Ship	5% of the DR distance
Submarine (military)	5% of the DR distance
Aircraft (more than two engines)	5% of the DR distance
Aircraft (twin-engine)	10% of the DR distance
Aircraft (single-engine)	15% of the DR distance
Submersible	15% of the DR distance
Boat	15% of the DR distance

Table N-3 – *Dead reckoning errors*

From: IAMSAR Manual Vol. II, 1999, IMO/ICAO