

*Aviation Safety Associates llp*



**Withernsea Blue Light Weekend (BLW) Air Display 2024  
Risk Management**

First Edition v1.2

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## Duty of Care

The regulation of flying displays by both civilian and military authorities establishes the separation between aircraft and public areas, and the location of flying display areas reduces the risk of occurrences; but, statistically, an occurrence could occur. The Event Organiser (EO) & Flying Display Director (FDD) have the duty of care to ensure that contingency plans are developed in conjunction with the Emergency Services for the Withernsea BLW Air Display on 11<sup>th</sup> August 2024, and the FDD is responsible for carrying out a thorough risk assessment for the air element of the display. The EO & FDD need assurance from the Emergency Services that their existing risk assessments and major incident plans are fully compatible with the requirements of the display; and that they consider safety precautions to be adequate.

## Air Display Management

The fundamental principle is to reduce to as low as reasonably practicable (ALARP) the risk to participants, spectators, and 3<sup>rd</sup> parties. The risks associated with this display have been managed to ensure that the display is as safe as possible; using qualitative judgement supported by quantitative assessment, good practice, regulations & standards.

The FDD is responsible to the EO, the UK Civil Aviation Authority (CAA), and the UK Military Aviation Authority (MAA) for the safe conduct of the display, which will be in accordance with the provisions of the CAA Civil Air Publications (CAP)403 (Flying Displays & Special Events: Safety & Administrative Requirements & Guidance) Edition 21, February 2024, and CAP1724 (Flying Display Pilot Authorisation & Evaluation: Requirements & Guidance) Edition 6, February 2024; and the MAA Regulatory Article (RA)2335, Issue 12, March 2024. The most restrictive flying activity/regulation of CAP403 and RA2335 will also be applied where appropriate. Compliance with these documents is assumed throughout the risk assessment.

The display location and display area have been selected in accordance with both CAP403 & RA2335. A RA(T) (M 078/2024) and an H Series NOTAM (AR-2024-1990) have been promulgated in accordance with Article 239 of the UK Air Navigation Order 2016 for the 11<sup>th</sup> August 2024 between 1000Z & 1500Z (1100L & 1600L) within a 2½ nm radius of 53.44.19N, 000.03.07E up to FL100. An Air Display Water Safety Zone (ADWSZ) will be established to minimise the risk from shipping/small craft incursions. The display will be managed by the FDD/DFDD who will have communications with the Emergency Services, and VHF communications with the display pilots/ teams.

If a breach of minima is perceived, if a limit is being pushed, or there is a safety concern that requires the display to be stopped, then the Standard Warning & STOP Calls procedures in CAP403 & RA2335 will be followed. In the event of a Terminate or STOP call aircraft are to recover to level flight and hold South of the display area until the situation has been resolved. Such curtailment should not be taken to imply that anything has been flown unsafely or in any way infringed flying regulations. It may have been necessitated by other safety considerations in the air, and the team will be advised of the reason(s) after the display.

## Emergency Services Support

- **Emergency support** will be provided by first aiders, Emergency services, RNLI, and HM Coastguard.

### - Ground Communications

FDD	Primary - 07789-435477 Secondary - 07479-330648
DFDD	07977-901711
EO	07734-882305
East Riding Events SAG	01482-393939
Emergency Services, RNLI & HM Coastguard	thro Event Control via ground radio

### - Occurrences

- **Alerting.** In the event of an air display occurrence the FDD will inform the emergency services, providing full details of the occurrence and of the aircraft involved.

- **Response.** The response to occurrences will be as required in accordance with the procedures published for both civil and military aircraft occurrences. In the event of an occurrence on the water, HM Coastguard will take the lead role in co-ordinating marine-based search and rescue activities.

### **Withernsea BLW Air Display Risk Assessment**

This Risk Assessment has been carried out with reference to the associated Aviation Risk Management Documents<sup>1</sup>. Additional information supplied by Display Teams & East Riding Events Safety Advisory Group (ESAG).

***The principal hazard is loss of control over the flying display***

#### **Formation Aircraft Mid-Air Collision**

The risk of a mid-air collision between aircraft of formation display teams is reduced to a minimum by the training, practice and experience of the crews, and the appropriate CAA clearances and approvals. The possibility of a mid-air collision cannot be ruled out entirely; **Hazard 1**.

#### **Aircraft Structural Integrity & Engine or Major System Failure**

All aircraft planned to participate have been manufactured and maintained to rigorous standards, and the risk of structural or engine failure of any aircraft involved is considered to be **Medium**. All aircrafts' structural and engine safety records are good. Notwithstanding that, the risks attached to either structural or major system failure, or an engine failure in a single-engine aircraft<sup>2</sup> need to be assessed; **Hazard 2**.

#### **Birdstrike**

The possibility of a birdstrike cannot be ruled out entirely, especially with aircraft flying over the sea; the overall risk of a birdstrike is considered to be **Medium**. Spurn Peninsula Bird Sanctuary is 8nm to the South South-East; surface to 500ft AGL; **Hazard 4**.

#### **Pilot Incapacitation**

Display pilots are medically fit, regularly examined, and issued with either a CAA European Union Class 1 or Class 2 Medical Certificate, or a UK Ministry of Defence Medical Category. Notwithstanding that, the risks attached to pilot incapacitation in an aircraft flown by a single pilot need to be considered. The outcome of such incapacitation is likely to be the same as that for either structural failure or engine failure in a single-engine aircraft; **Hazard 2**. Pilot incapacitation without aircraft loss of control is considered at **Hazard 5**.

#### **Multi-Engine Aircraft**

The inherent build and safety standards of multi-engine aircraft mean that in the event of a 'worst-case' single engine failure in flight, the aircraft is able to continue flight on the remaining engine(s) without undue danger and/or concern to public safety.<sup>3</sup> The risks in using multi-engine aircraft in the air display are considered to be **Low** as the aircraft can clear the area in the event of failure of a single engine.

#### **Long Term/post-Event Effects of an Occurrence at, or in connection with the Air Display**

There is a risk of liabilities due to any legal challenge/claim against the airshow organisation, EO, FDD, airshow staff & participants. Comprehensive insurance cover will be in place to cover those who might be affected.

#### **Assessment**

The display will take place offshore Withernsea Beach & Promenade; the display area cannot be marked but display line markers will be in place centred on the display datum. The majority of the crowd will be gathered along the promenade and beach in Withernsea, Waxholme & Hollym. Unless specifically authorised by the FDD, Display Crews are not to display closer to the crowd than 230m. Low overflight of Withernsea and adjacent areas is to be avoided.

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<sup>1</sup> Aviation Safety Associates llp, Flying Display Risk Management Framework Document, 5<sup>th</sup> Edition, attached; the MAA Regulatory Article 1210 v7, Military Aviation Risk Management; & the UK CAA CAP403, Edition 21, March 2024, Appendix A

<sup>2</sup> The relevant single-engine aircraft are the Extra NG, Pitts S1-E, Tiger Moth, Boeing Stearman

<sup>3</sup> The relevant multi-engine aircraft is the Typhoon

An ADWSZ will be in place and advertised and the FDD/DFDD will be in radio contact with the RNLI Lifeboat and Safety Boat. Every attempt will be made to restrict small craft from the display area, but there can be no guarantee that incursions will not occur. SAR support will be available through HM Coastguard. On-site will be first aid personnel & equipment, and emergency equipment will be available through Event Control.

Apart from Spurn Peninsula Bird Sanctuary (**Hazard 4**) there are no known other sensitive areas close by.

Withernsea Lighthouse, 127ft/39m, is located ¼ml inland.

Close liaison will be had with Garton Field located 6nm to the North North-West; Humberside Gateway TMZ, sfc to FL100, 2nm NE; and Westernmost Rough Heliports & HTZ, sfc to 2000ft, 6nm NE.

Specific risks that need to be addressed are either a structural or major system failure, or engine failure in a single-engine aircraft (**Hazard 2**); and pilot incapacitation in an aircraft operated by a single pilot (**Hazard 5**).

- a. displaying north-west to south-east and vice-versa in the display area.
- b. joining the display area from either the south-east, or north-west.

These and other risks are assessed below; the overall level of risk for the air display is considered to be **Low**. Some risk will always reside with the EO, as the aircraft involved would not have been flying if the air display had not been held.

Hazard Description	Risk (including location, where appropriate)	Initial rating			Mitigation Measures (where applicable)	Final rating			Remarks (if applicable)
		L	S	R		L	S	R	
1. Formation Aircraft Mid-Air Collision	The possibility of a mid-air collision cannot be ruled out entirely, resulting in accidents, and/or personal injury, and/or damage to property Risk to Display Pilots/ Teams, air display spectators, uninvolved Secondary Spectators & 3 <sup>rd</sup> Parties	2	5	10	The training, practice and experience of the crews, and the appropriate UK MAA clearances & approvals Aircraft certification & maintenance Comprehensive briefing; rehearsal as required Aircraft protected from interference from unauthorised persons Rigorous pre-flight checks conducted Aircraft operate to the maximum extent offshore The Display Hold is offshore	1	5	5	Risk reduced from <b>High</b> to <b>Medium</b>
2. Engine Failure in a single-engine aircraft Structural or major system failure; including failure caused by manoeuvre error	Aircraft or aircraft wreckage impacts populated area resulting in occurrences, and/or personal injury, and/or damage to property Area of coast around Withernsea, Waxholme & Hollym; and the general coastal area Risk to Display Pilots/ Teams, air display spectators, uninvolved Secondary Spectators & 3 <sup>rd</sup> Parties	3	4	12	Aircraft certification & maintenance Comprehensive briefing Aircraft protected from interference from unauthorised persons; rigorous pre-flight checks Ability of pilot to steer ac away from populated area Appropriate Crash & Disaster planning & Emergency Services' response Military aircraft will operate outside of the Display Area iaw the provisions of CAP403 & RA2335 which further protect 3 <sup>rd</sup> parties outside the Display Area Display Aircraft to route and hold as much as possible over the sea; display hold is offshore Pilots to avoid overflying densely populated areas	2	3	6	Risk reduced from <b>High</b> to <b>Medium</b> Chances of a random aircraft crash impacting a 3 <sup>rd</sup> Party at sea is extremely remote

Hazard Description	Risk (including location, where appropriate)	Initial rating			Mitigation Measures (where applicable)	Final rating			Remarks (if applicable)
		L	S	R		L	S	R	
3. Airspace infringement by non-participating aircraft	Risk of conflict/collision with participating aircraft Risk of distraction for Display pilots Risk to Display Pilots/ Teams, air display spectators, uninvolved Secondary Spectators & 3 <sup>rd</sup> Parties, private pilots on non-commercial flights	3	3	9	Airspace protected by a RA(T) & NOTAM promulgated in advance of the event Display aircraft operate VFR Display pilots' awareness FDD/DFDD on the look out for intruders during periods of flying; flying suspended if necessary FDD/DFDD use of Flightradar24 to monitor aircraft activity	2	3	6	Risk reduced from <b>High</b> to <b>Medium</b>
3. Birdstrike	The possibility of a bird-strike cannot be ruled out entirely. Spurn Peninsula Bird Sanctuary is 8nm to the South South-East; surface to 500ft AGL Risk to Display Pilots/ Teams, air display spectators, uninvolved Secondary Spectators & 3 <sup>rd</sup> Parties	2	3	6	FDD/DFDD oversight and monitoring of bird activity, and full briefing of display pilots and their subsequent awareness will all help to mitigate the risk of birdstrike Display Aircraft to route and hold as much as possible over the sea, and avoid the Spurn Peninsula Bird Sanctuary Military aircraft will operate outside of the Display Area iaw the provisions of CAP403 & RA2335 which further protect 3 <sup>rd</sup> parties outside the Display Area	2	3	6	Risk remains at <b>Medium</b>
4. Pilot Incapacitation/ Fatigue w/out aircraft loss of control	Possible aircraft diversion Risk of increased workload for the Emergency Services, and suspension of relevant airport operations	2	3	6	Display pilots are medically fit, regularly examined, and issued with either a UK CAA European Union Class 1 or Class 2 Medical Certificate, or a UK Ministry of Defence Medical Category. See also <b>Hazard 15</b>	1	2	2	Risk reduced from <b>Medium</b> to <b>Low</b>
6. Bad weather affecting the Display Area	Risk of participants getting into difficulty maintaining VFR Risk to Display Pilots/ Teams, air display spectators, uninvolved Secondary Spectators & 3 <sup>rd</sup> Parties	2	3	6	CAP403 & RA2335 give absolute weather minima for display aircraft, and individual Display Aircraft/ Teams may have their own weather minima Weather will be discussed at Display Briefings FDD/DFDD will advise/monitor wx conditions, and be in radio contact with display participants; the display can be suspended/stopped if the wx deteriorates	1	2	2	Risk reduced from <b>Medium</b> to <b>Low</b>

Hazard Description	Risk (including location, where appropriate)	Initial rating			Mitigation Measures (where applicable)	Final rating			Remarks (if applicable)
		L	S	R		L	S	R	
7. Aircraft collision with terrain(CFIT)	Aircraft impacts populated area resulting in occurrences, and/or personal injury, and/or damage to property Area of coast around Withernsea, Waxholme & Hollym; and the general coastal area Risk to Display Pilots/ Teams, air display spectators, uninvolved Secondary Spectators, 3 <sup>rd</sup> Parties	2	3	6	Military aircraft will operate outside of the Display Area iaw the provisions of CAP403 & RA2335 which further protect 3 <sup>rd</sup> parties outside of the Display Area Display Aircraft to route and hold as much as possible over the sea and to avoid overflying densely populated areas The Display Hold is offshore	1	3	3	Risk reduced from <b>Medium</b> to <b>Low</b>
8. Unmanned aerial systems (UAS)/drones flown in the vicinity of the Display Area	Risk of collision with an aircraft. Risk of distraction for pilot, or FDD/DFDD looking for reported drone Risk to Display Pilots/ Teams, air display spectators, uninvolved Secondary Spectators & 3 <sup>rd</sup> Parties	2	2	4	In the event of UAS/drone activity in the vicinity of the display, the display will be suspended immediately Only once the FDD/DFDD is satisfied that the activity in question has ceased shall he permit the display to resume	1	2	2	Risk reduced from <b>Medium</b> to <b>Low</b>
9. Marine Incursion into the Display Area	The presence of involved or uninvolved 3 <sup>rd</sup> Parties in the display area increases the exposure to risk Risk to Display Pilots/ Teams, and uninvolved 3 <sup>rd</sup> Parties (eg, recreational boat occupants, commercial marine operators, passengers, etc)	2	2	4	An ADWSZ has been established to minimise the risk from shipping/small craft incursion Engagement with the local community about the ADWSZ, and advise the local boat club of the Zone Emergency services to be on standby, and RNLI and safety boat to be on the water Every attempt will be made to restrict shipping/ small craft from the display area, but there can be no guarantee that problems will not occur If a significant hazard develops the display will be suspended/stopped	1	2	2	Risk reduced from <b>Medium</b> to <b>Low</b> Negligible residual risk of spectators in small craft attempting to watch the display from the sea

Hazard Description	Risk (including location, where appropriate)	Initial rating			Mitigation Measures (where applicable)	Final rating			Remarks (if applicable)
		L	S	R		L	S	R	
10. Noise Pollution/ Hearing Damage	Risk to Display Pilots/ Teams, air display spectators, uninvolved Secondary Spectators & 3 <sup>rd</sup> Parties, Withernsea residents en-route and in the vicinity of the Display Area	2	2	4	Pilots to avoid overflying densely populated areas Engagement with the local community to advise them about the event & aviation activity The display area positioning - over the sea - ensures a minimum of 230m separation from all primary, secondary and incidental crowd areas	1	2	2	Risk reduced from <b>Medium</b> to <b>Low</b>
11. Occurrence resulting in HAZMAT ie, MMMF, fuel, lubricants, etc	Exposure to, and effect on, crowds in the vicinity of the incident, or downwind of it Risk to Display Pilots/ Teams, air display spectators, uninvolved Secondary Spectators & 3 <sup>rd</sup> Parties	2	2	4	RNLI, Emergency Services and HM Coastguard staff trained to respond to incidents/accidents according to their standard operating procedures Information on aircraft hazardous materials can be obtained through the FDD and his team who will be able to provide additional advice	1	2	2	Risk reduced from <b>Medium</b> to <b>Low</b>
12. Unintended overflight of built up areas	Area of coast around Withernsea, Waxholme & Hollym; and the general coastal area Risk of surprise to air display spectators, uninvolved Secondary Spectators & 3 <sup>rd</sup> Parties by sudden and low overflight, with potential for road traffic collisions, distraction, occurrences, and/or personal injury	3	2	6	Military aircraft will operate outside of the Display Area iaw the provisions of CAP403 & RA2335 which further protect 3 <sup>rd</sup> parties outside of the Display Area Display Aircraft to route and hold as much as possible over the sea and to avoid overflying densely populated areas Engagement with the local community to advise them about the event and aviation activity Appropriate Crash & Disaster planning & Emergency Services' response The display area positioning - over the sea - ensures a minimum of 230m separation from all primary, secondary and incidental crowd areas The Display Hold is offshore	2	1	2	Risk reduced from <b>Medium</b> to <b>Low</b>

Hazard Description	Risk (including location, where appropriate)	Initial rating			Mitigation Measures (where applicable)	Final rating			Remarks (if applicable)
		L	S	R		L	S	R	
13. Not being able to respond to an emergency situation and provide dynamic crowd management and advice to the Public	Risk that failure to provide dynamic crowd management and advice to the public could cause anxiety or panic due to people not knowing what is happening or what to do Risk to Display Pilots/ Teams, spectators, uninvolved Secondary Spectators & 3 <sup>rd</sup> Parties	2	2	4	A Public Address system will be in place for crowd control FDD has provided the EO with pre-prepared emergency messages for crowd control Ground radio communication with Silver Control	1	2	2	Risk reduced from <b>Medium</b> to <b>Low</b>
14. Fatigue to key personnel, pilots, and display support staff	Inability of personnel to undertake their role efficiently Risk to Display Pilots/ Teams, spectators, uninvolved Secondary Spectators & 3 <sup>rd</sup> Parties	2	2	4	Personnel will be briefed on the need to have adequate rest and refreshments Individuals will not be over-tasked in their roles and activities will be sensibly arranged and timed Personnel will be monitored for signs of tiredness, inattention, etc	1	2	2	Risk reduced from <b>Medium</b> to <b>Low</b>
15. FDD unable to function (ie, monitor/stop/suspend the display), or liaise with external agencies due comms failure	Risk to Display Pilots/ Teams, air display spectators, uninvolved Secondary Spectators & 3 <sup>rd</sup> Parties	2	2	4	The Air Display can only be conducted if the conditions established in the Display Brief can be satisfied The FDD/DFDD have backup comms facilities available, and the Display can be suspended/ stopped if the comms fail If necessary, the RNLI Lifeboat and/or Safety Boat will proceed to and circle the Display Datum to indicate to pilots that display comms have failed. Pilots should, at their discretion, complete their display, depart the Display Area to the South, and recover to their operating base as necessary Display Pilots/Teams should consider the absence of Standard Warning & STOP Calls from the FDD in their decision whether or not to continue the display.	1	2	2	Risk reduced from <b>Medium</b> to <b>Low</b>



Hazard Description	Risk (including location, where appropriate)	Initial rating			Mitigation Measures (where applicable)	Final rating			Remarks (if applicable)
		L	S	R		L	S	R	
16. Competence of FDD	Limited experience and or competence leading to bad decision making/planning Risk to Display Pilots/ Teams, air display spectators, uninvolved Secondary Spectators & 3 <sup>rd</sup> Parties	2	2	4	The CAA & MAA have to be satisfied as to the FDD/DFDD's competence and experience before issuing the necessary Permission The nominated FDD & DFDD are CAA/MAA accredited	1	2	2	Risk reduced from <b>Medium</b> to <b>Low</b>
17. Control Measure/ Mitigation Fidelity	Risk to Display Pilots/ Teams, air display spectators, uninvolved Secondary Spectators & 3 <sup>rd</sup> Parties	2	2	4	Critical elements of the Air Display can only be conducted with the necessary compliance Compliance will be monitored by the EO & FDD The Air Display can be suspended/stopped if non-compliance is evident, and/or oversight compromised The Display Pilots are professionals demonstrating the standards required	1	2	2	Risk reduced from <b>Medium</b> to <b>Low</b>
18. Lateral Separation	Risk to Display Pilots/ Teams, air display spectators, uninvolved Secondary Spectators & 3 <sup>rd</sup> Parties	2	2	4	The mandated lateral separation is essential for a safe Air Display The FDD/DFDD will be positioned to help Air Display participants to maintain the required separation The Display Pilots/Teams have a responsibility to maintain the required separation and this will be emphasised during the briefs to pilots	1	2	2	Risk reduced from <b>Medium</b> to <b>Low</b>

### Aircraft Crash & Rescue

For the purposes of aircraft crash & rescue, the maximum occupancy of the Typhoon, Pitts S1-E, Extra NG, Stearman and Tiger Moth is one.

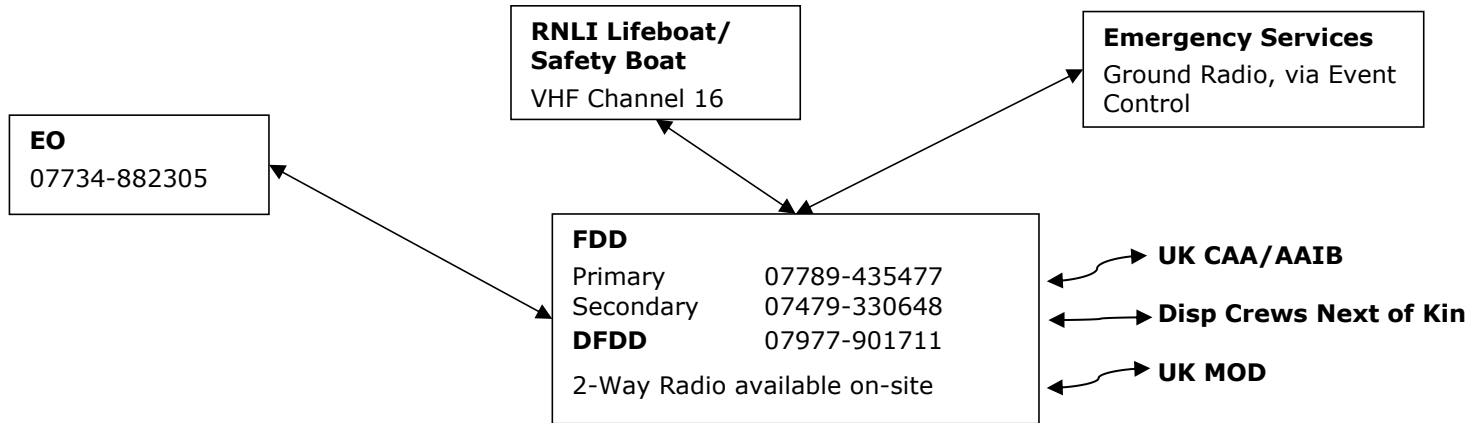
### Aircraft equipped with Ejection Seats

Typhoon

### Aircraft Hazardous Materials

Information on aircraft hazardous materials can be obtained through the FDD.

**Ground Communications Matrix**



I confirm that this Risk Assessment is suitable and sufficient to manage the risks associated with the flying display as referenced above.

<p><b>FDD Sign Off</b></p>	<p><b>Barry Neal</b> CAA/MAA Accredited; UK FDD 1C-005</p>	<p><b>Signature &amp; Date:</b></p>
<p><b>Event Organiser Countersignature</b></p>	<p><b>Andy Medcalf</b> Withernsea Blue Light Weekend</p>	<p><b>Signature &amp; Date:</b></p>

### Risk Management Review History

<b>Version No</b>	<b>Effective Date</b>	<b>Comments</b>
1.0	27 <sup>th</sup> May 2024	Original
1.1	3 <sup>rd</sup> July 2024	Addition of DFDD and Boeing Stearman aircraft
1.2	31 <sup>st</sup> July 2024	Changes throughout the document due to the withdrawal of BBMF