Space Launch and Orbit Group

Launch Session

July 2022

Welcome

Agenda

Welcome

Current challenges

- Applications update
- Airspace - NATS
- Marine Licensing - MMO
- AEE update

Future opportunities

- Launch liability and insurance update - DfT

Hot topics

- LCOLA
- Payload licensing for foreign operators
- Q&A / feedback

AOB

Welcome

Housekeeping

- Please mute microphones
- Please use chat or raise Teams hand to ask any questions
- We will publish the slides and actions from this meeting, not verbatim minutes, on our website at caa.co.uk

Applications

Continuous improvement

We're taking an 'agile' approach to delivering improvements

Why are we doing this?

- This is new to us and to you we're all learning
- To incorporate your feedback as quickly as we can
- Working in shorter focused periods of time (2–3week sprints) enables workload to be prioritised, developed and delivered

Continuous improvement

We're taking an 'agile' approach to delivering improvements

Examples of work delivered so far:

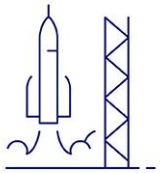
- Enhanced pre-application process
- Introducing online inspections
- Reviewing and improving our guidance and website content

Examples of work in the pipeline:

- Reviewing the AEE within the wider licensing process
- Review our oversight guidance and processes
- Updating our guidance for pre-application

Applications

All licence applications received



Spaceport

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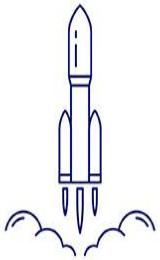

Launch

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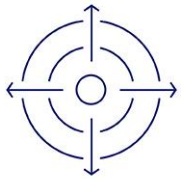


Range

2

ANO

2

Applications

Insights from our first year as the UK's space regulator

Preparation & quality reduces application time	We have seen applications that have appeared to have been rushed, with required information not included. It is essential enough time is planned for the submission to be complete and of sufficient quality to avoid applications being put on hold
Use generic/typical data or Information	Whilst we recognise that data, people and processes are often in development at the point of application, please use generic/typical data or information so the application can continue. We expect a degree of iteration during the licensing process.
Consider and build in key requirements early	Upfront focus on key requirements (e.g. engaging a competent expert to conduct the Assessment of Environmental Effects or taking account of security early in the safety case development) will likely avoid delays and save time in the long run.
Feedback welcome	We have received some good feedback which shapes ongoing development of our systems and processes. Please continue to let us know directly what works well and what needs improving.

Applications

Good quality documents and evidence for an application takes time

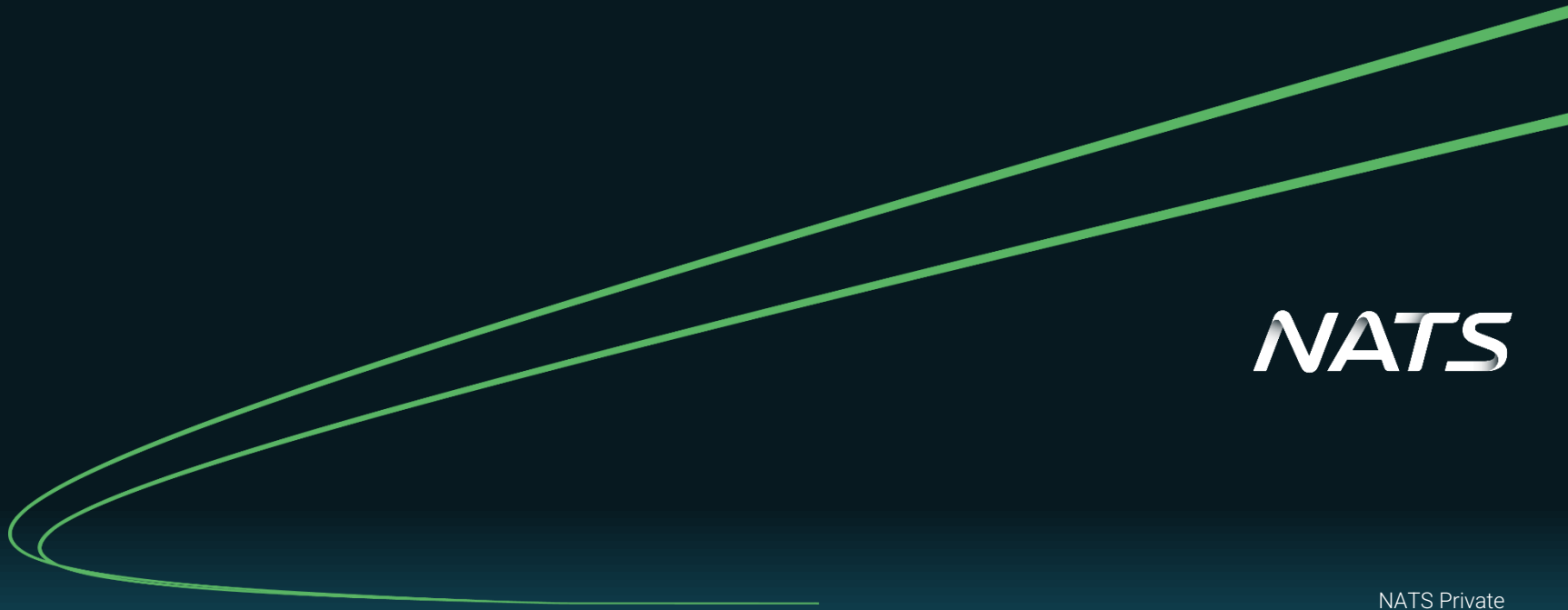
	Start			Submit application						Total Time
Launch	Document & evidence preparation 3-6 months			Licensing process 9-18 months				1-2 months	Planned activity	13-26 months
Spaceport	Document & evidence preparation 3-6 months			Licensing process 6-18 months			1-2 months	Planned activity		10-26 months
Range	Document & evidence preparation 2-4 months			Licensing process 6-18 months			1-2 months	Planned activity		9-24 months
Orbital	Document & evidence preparation 2-4 months (New Operators)			Licensing process 6-12 months			1-2 months	Planned activity		9-18 months

Licensing processing time is a guide, it could be slightly shorter or longer dependent on the complexity of the application and the quality of the submitted documents and evidence, we will always process your application as fast as possible, planning with shorter timescales is at your own risk.

Airspace

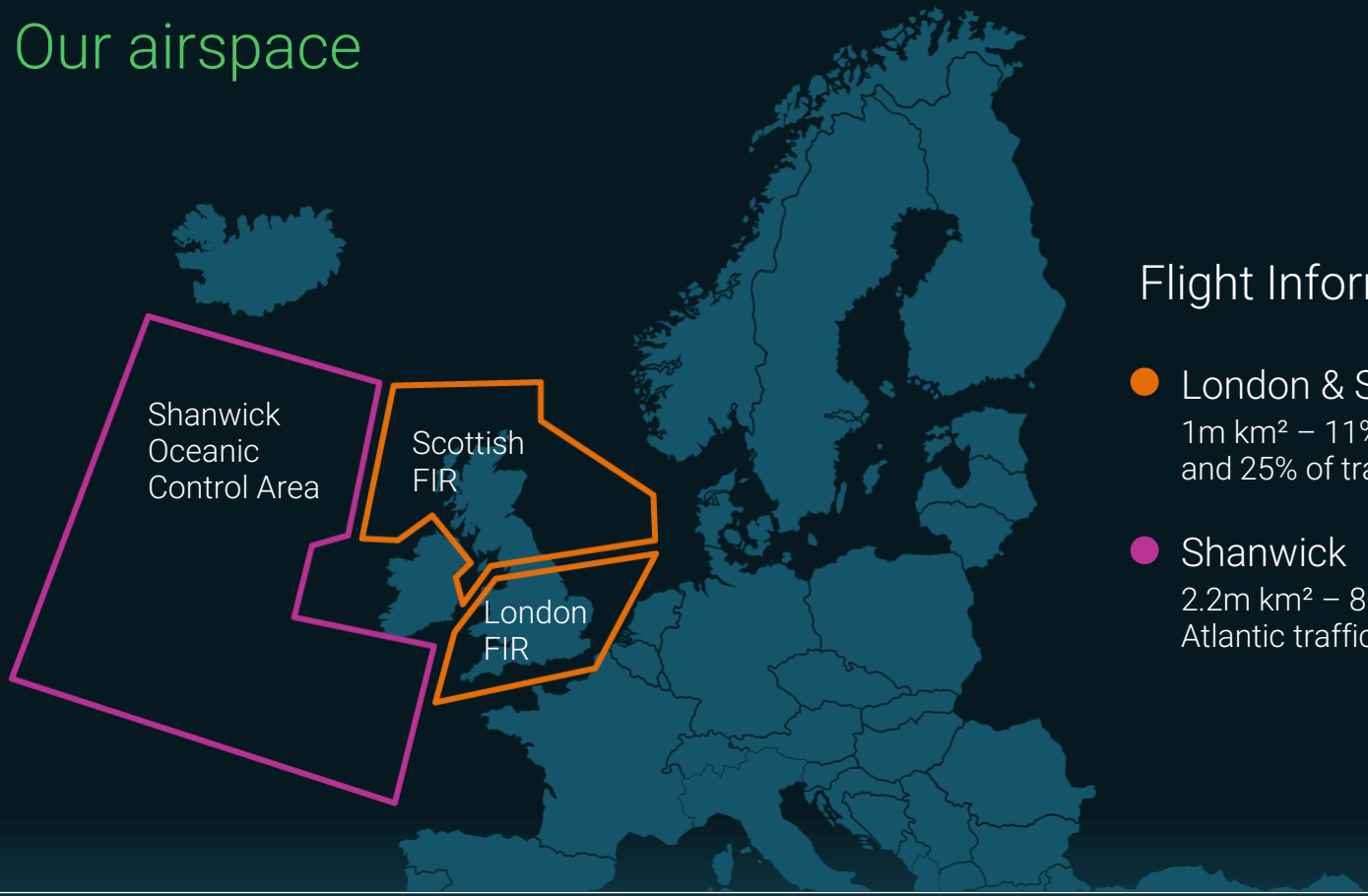
NATS

ANSP Perspective on ACPs



NATS

Our airspace

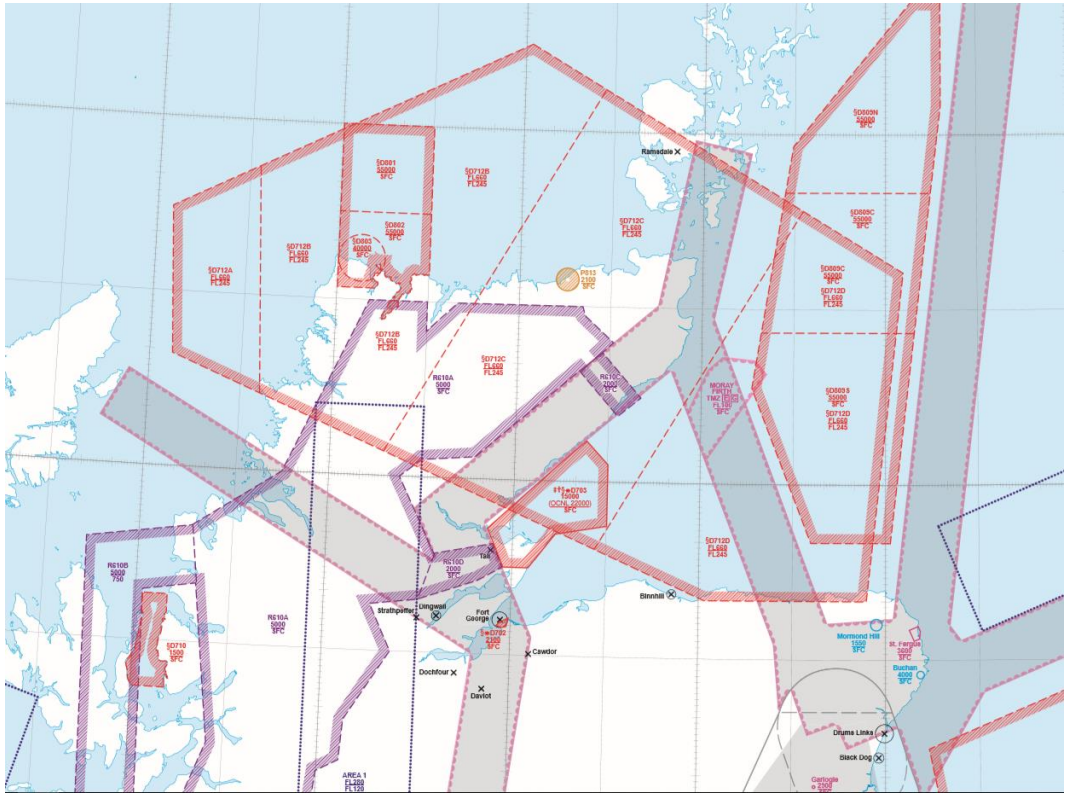


Flight Information Regions

- **London & Scottish FIRs:**
  1m km² – 11% of Europe's airspace and 25% of traffic
- **Shanwick**
  2.2m km² – 80% of North Atlantic traffic

UK Airspace

- Defined in AIP
- Temporary Activation / Modification by NOTAMs



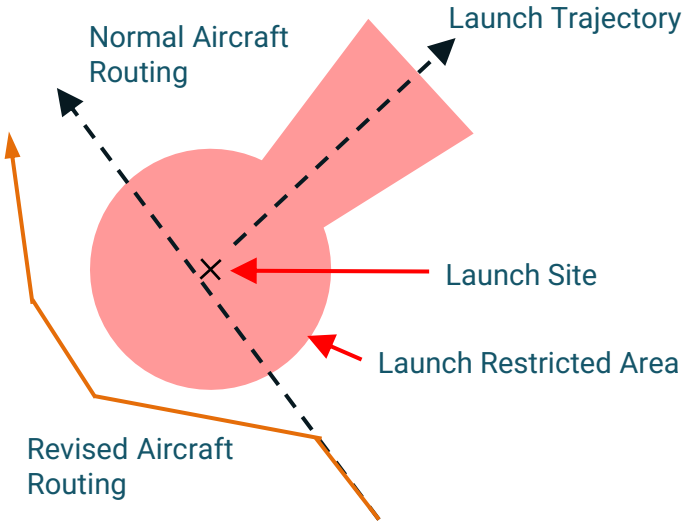
Danger Area Responsibilities

Define and Assure Safe Restricted Area – Launch Operator/ Range /Spaceport

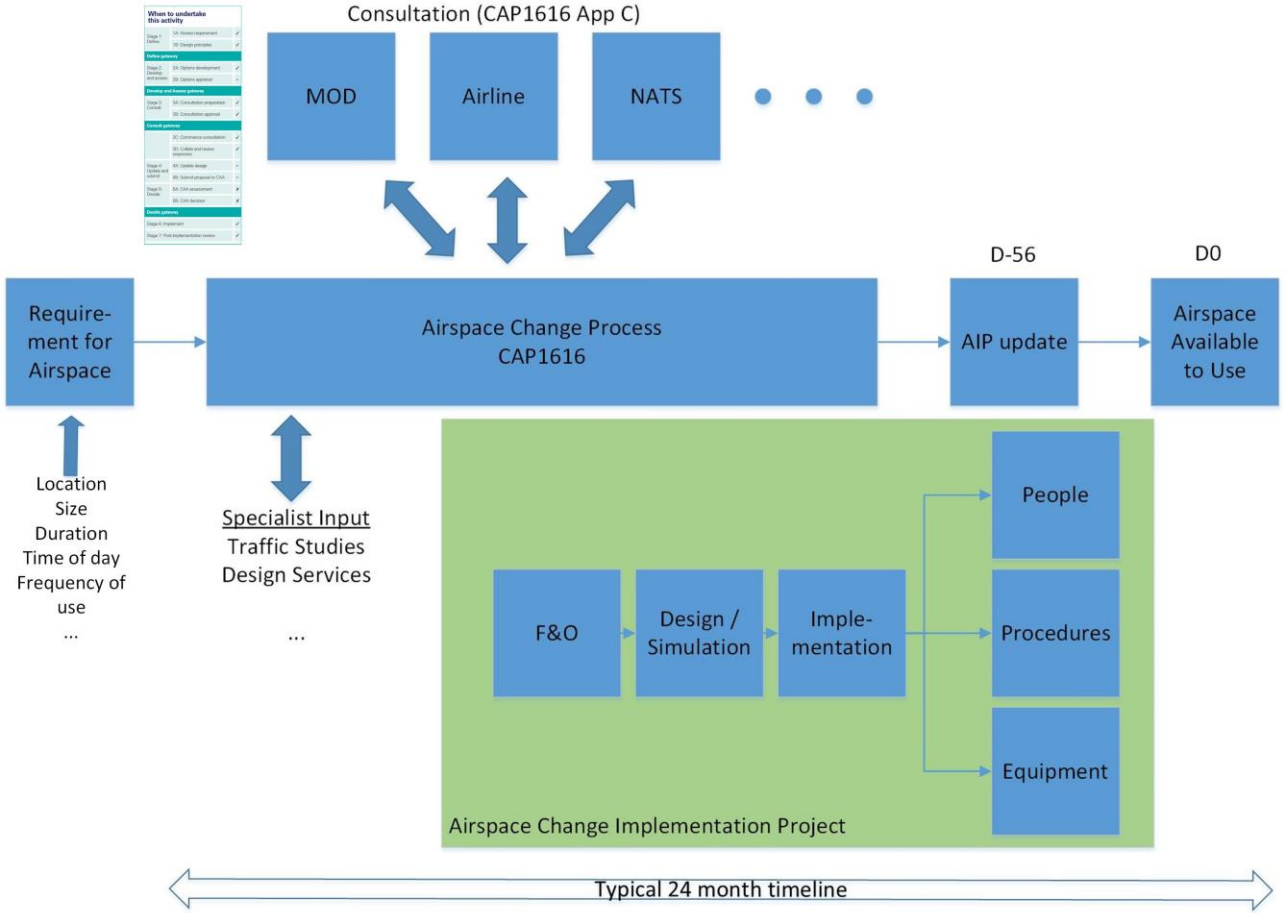
Approve Safe Restricted Area – Regulator

Range Operator – Ensure DA is clear

Route Aircraft Safely Round Restricted Area - NATS



Airspace Change Process



NATS Needs in ACP Process

Clear single vision of airspace need

ADQ Compliant co-ordinates

Declaration of airspace buffers in proposal

Realistic airspace usage prediction over time

Declaration of expected time of day for use

Understanding of Network impact

Inclusion of sufficient time for airspace notification processes

Recognition of other restricted airspace users booking needs

Positive Ways to Engage

Single POC

Clear upfront airspace needs

Clear use of agreed terminology

Sponsor runs co-ordination meetings between all parties for clear plan and responsibilities

Short clear launch windows enables manning to support, extended repeated windows does not

Clear activation / cancellation timelines round nogo points for launch

Airspace Impact of Launches

Drivers for Range size and usage

What being Launched?
- Size – Microsat < 500kg
- Composition – Carbon Fibre, Metal
- Maturity – Launcher pedigree
- Orbital vs Sub-Orbital

Range Size? Lateral and Vertical dimensions

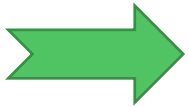
Where? Launch Site
Orbital slot for “prime satellite”

When? Time of Day
/ Launch Window Flexibility

Duration? Launch length
(e.g. Rocket vs Balloon 1st stage)

Cadence? How often
(Daily/Weekly/Monthly)

Return? Reusable Vehicle/Booster Stages/
Passenger Flight



Effects on Existing Airspace Users

Flight Delays

Additional track miles
- Fuel
- Aircraft Crew Time
- En-Route Charges

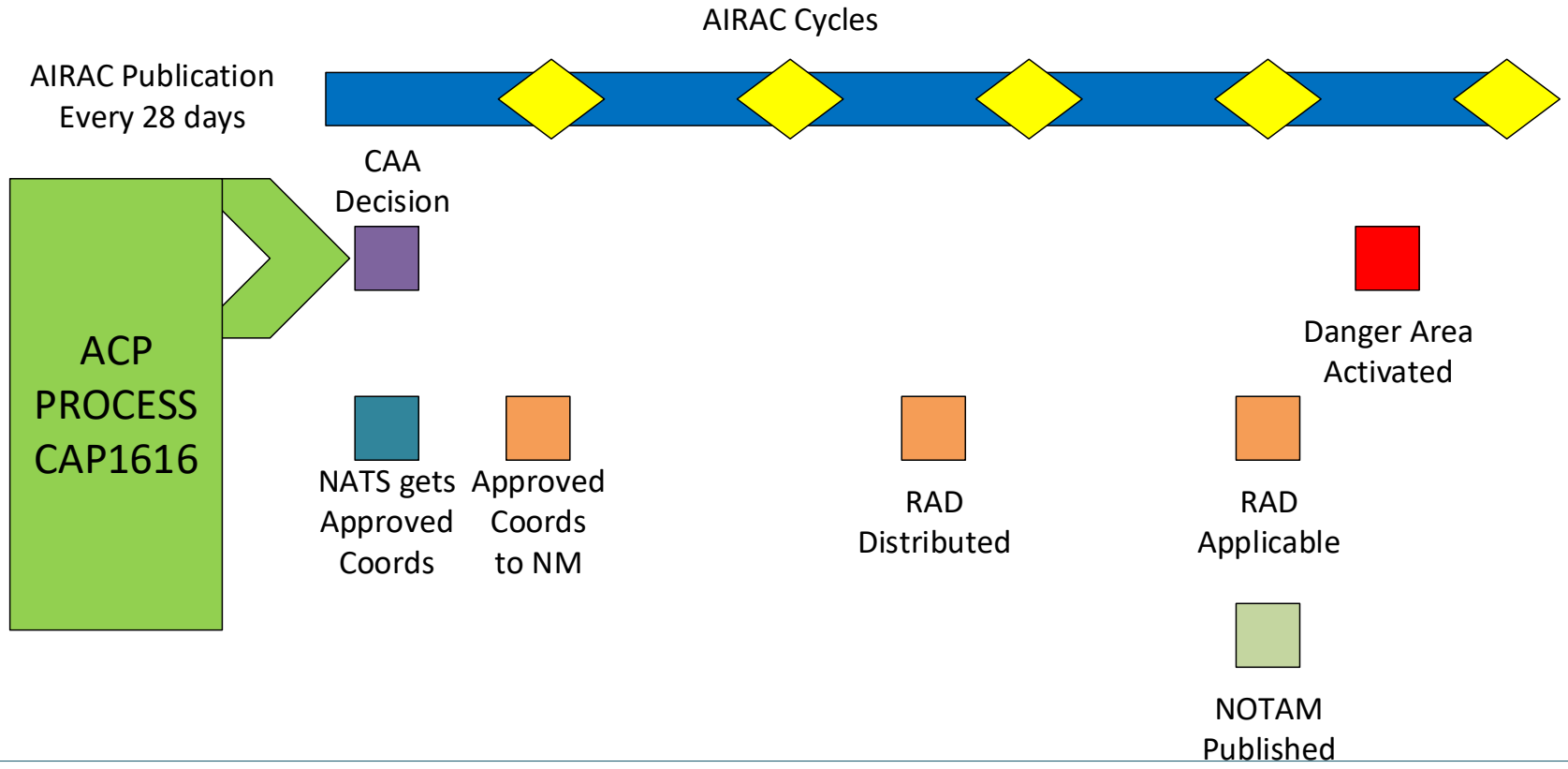
Potential lost revenue from cancellations

Cost of Danger Area implementation

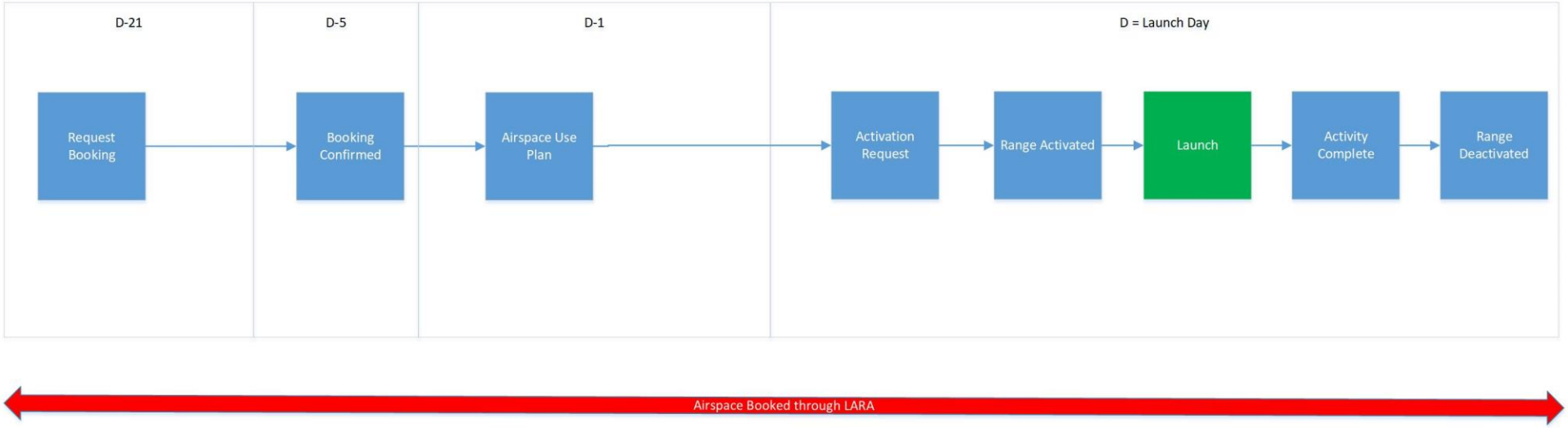
ATC Workload

ATC Staffing

What we do once Airspace Approved



Range Airspace Management



Benefits Permanent vs Temporary

Temporary

Significant upfront work for **each** and **every** launch

Wider range of potential launch points

Possible to tune for vehicle

New LOA each time

Individual Airspace Approvals

Permanent

more upfront work

Ability to then book airspace without ACP

Shorter lead time once approve, more operational flexibility

Fixed launch location

Standard LOA

Single Airspace Approval

Key Points

Allow time for ACP process

Talk to stakeholders early

NATS and MOD will be stakeholders for all these ACPs

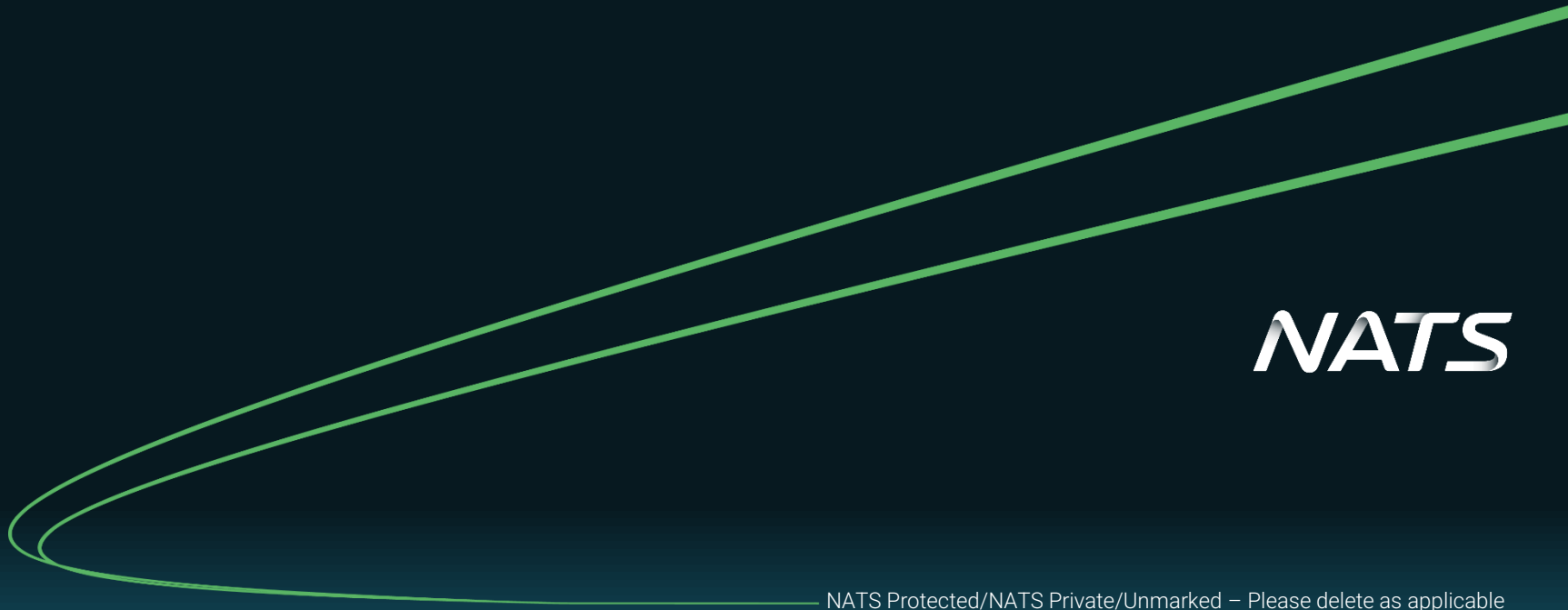
ACP process only applies to UK Airspace

ICAO NER-PT produced guidance on how to engage on the North Atlantic Ocean

Book launch windows early

Prioritisation of activation will consider other bookings. E,g military exercises

Thank you



What we do

Operation of two air traffic control centres to manage UK airspace

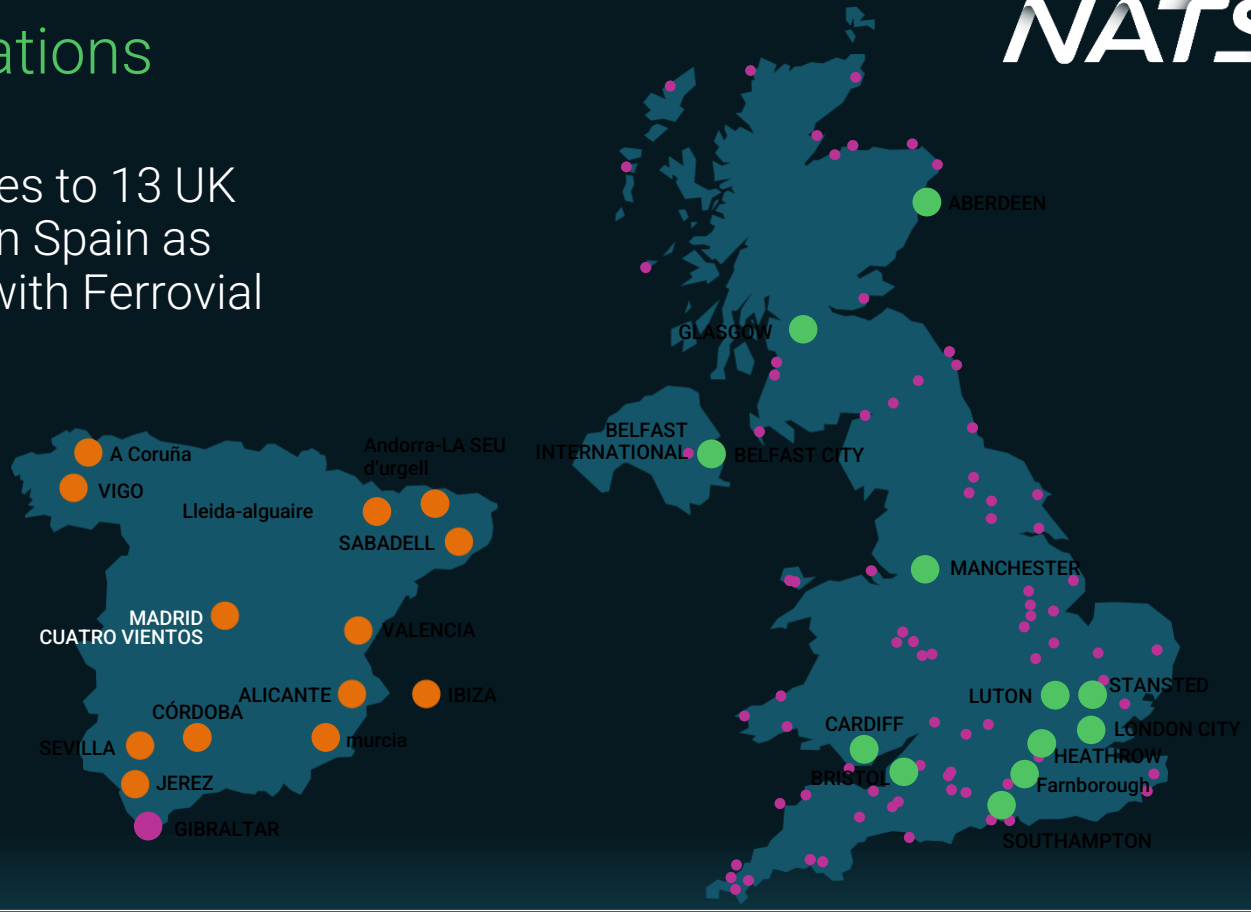
Provide air traffic control services at 13 UK based airport towers and Gibraltar

Provide aviation services to airlines, ANSPs, governments and the military in over 20+ countries

ATC Service Locations

We provide ATC services to 13 UK Towers, Gibraltar and in Spain as part of a joint venture with Ferrovial

- Operated by NATS
- Operated by FerroNATS
- Operated by Aquila



Marine Licensing

MMO

Marine Management Organisation

UK Space Industry Forum
8 July 2022

Paul Stephenson
Marine Licensing Senior Case Manager

Mark Qureshi
Marine Licensing Case Manager
Marine Management Organisation (MMO)

...ambitious for our seas and coasts

Marine Management Organisation

Who are MMO?

The Marine Management Organisation (MMO) is a non-departmental public body (NDPB) established under the Marine and Coastal Access Act 2009. It came into force in April 2010, as an amalgamation of previous consenting regimes.

The MMO inherited the work of the Marine and Fisheries Agency (MFA) and acquired several important new roles/functions from Department for Transport (DfT) and Department for Business, Energy and Industrial Strategy (BEIS).

Why MMO?

Established to make a significant contribution to sustainable development in the marine area and to promote the UK government's vision for clean, healthy, safe, productive and biologically diverse oceans and seas.

Marine Management Organisation

Six key services – outcome focussed & outward facing

Ensuring sustainable marine development - Marine Licensing and Planning

Managing sustainable fishing opportunities - Fisheries Management Team

Protecting marine habitats & wildlife - Marine Conservation Team

Administering marine support funds – Fisheries and Seafood Scheme

Delivering regulatory support & assurance

Supporting global marine protection

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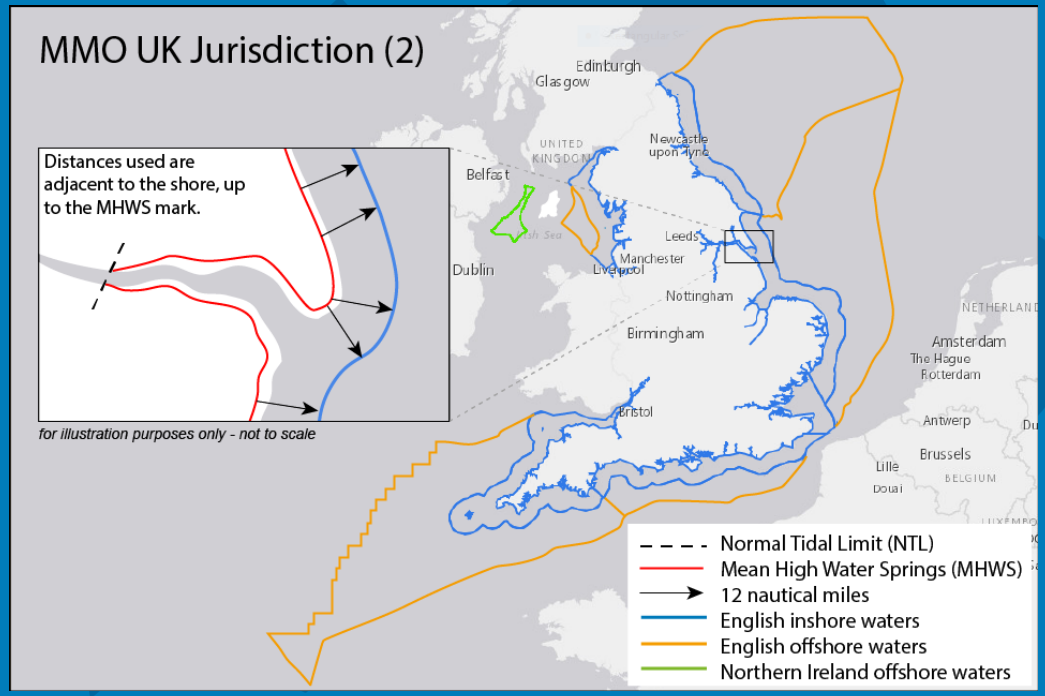
Marine Management Organisation

MMO jurisdiction - English waters



Any area submerged at Mean High Water Spring (MHWS) tide up to the Exclusive Economic Zone (EEZ) and the UK sector of the continental shelf 200nm).

This comprises:

1. The inshore area (MHWS – territorial limit); and
2. The offshore area (territorial limit – EEZ/200nm)

Marine Management Organisation

MMO - people

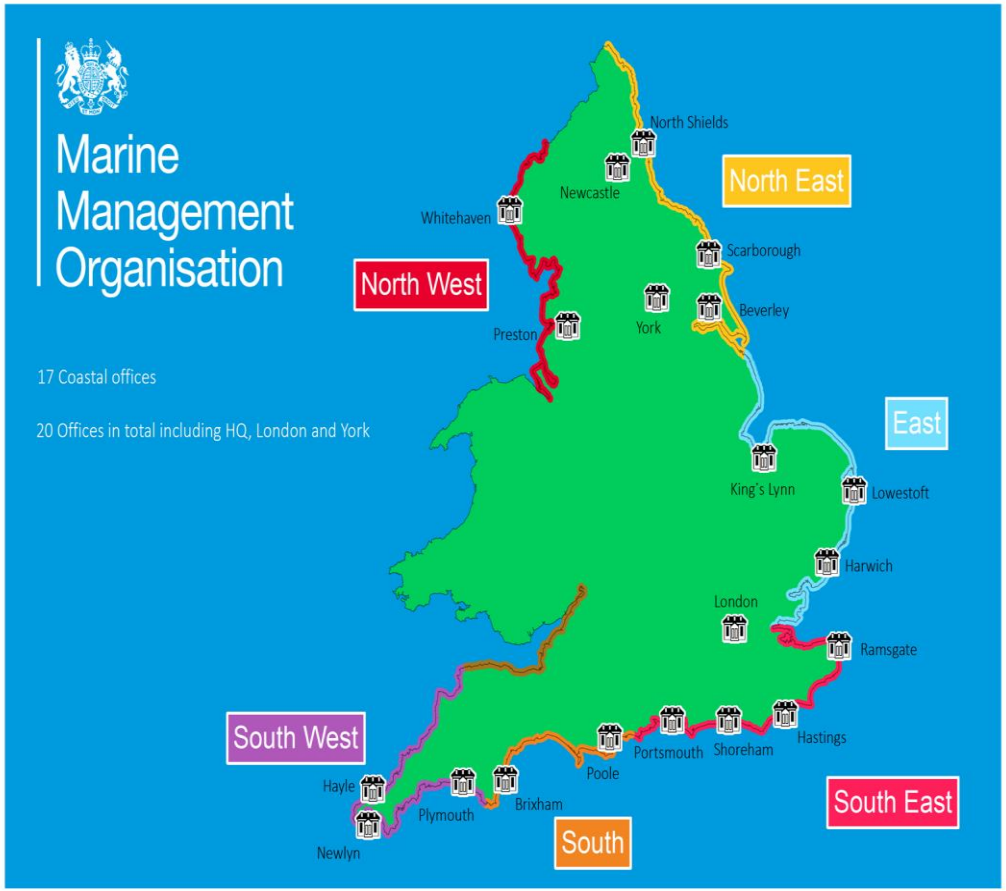
Almost 450 people

Headquarters are in Newcastle upon Tyne

14 local offices around the English coast

6 Marine Areas:

- North East
- North West
- East
- South East
- South
- South West



Marine Management Organisation

What is a Marine Licence?

- The marine equivalent of planning permission on land (i.e. **development control** in terrestrial planning)
- Came into force in April 2011, an amalgamation of previous consenting regimes
- MMO is the **appropriate licensing authority** for licensable activities in English waters
- Marine licensing regime is broad and captures most activities
- A legal document containing conditions which are monitored and enforced post consent to allow for sustainable development of a project

Why Marine Licensing?

- It is an amalgamation of dated legislation, providing a more streamlined process that removed the need for developers to gain multiple licenses.
- It aims to ensure that activities in the marine area are undertaken in a sustainable manner
- Various treaty and EU obligations (now transposed into UK Law) are implemented through the marine licensing regime
- Marine Licensing team services are chargeable (cost recovery); 13 week KPI

Marine Management Organisation

The legislation

Section 69 of MCAA 2009: In determining an application for a marine licence the appropriate licensing authority must have regard to;

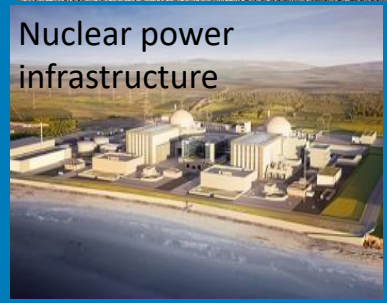
- (a) the need to protect the **environment**,
- (b) the need to protect human **health**,
- (c) the need to **prevent interference** with legitimate uses of the sea,
- **And such other matters as the authority thinks relevant**.

This means we can consult widely (depending on the application in question).

- In accordance with **UK marine policy statement** or **marine plan**
- Marine Conservation Zones
- Habitats Regulations (SAC, SPA; Ramsar sites)
- Water Framework Directive
- Family of consultees (Natural England, Env Agency, Local Planning Authorities, Harbour Authorities)
- Cefas – our scientific advisors

Marine Management Organisation

Licensable activities



Marine Management Organisation

Examples

Thames Tideway Tunnel

UK SPACE AGENCY

Hinkley Point C

MMO Self Service

Bridge Preservation in Hull

London Gateway

G7 Conference 2021- Cornwall

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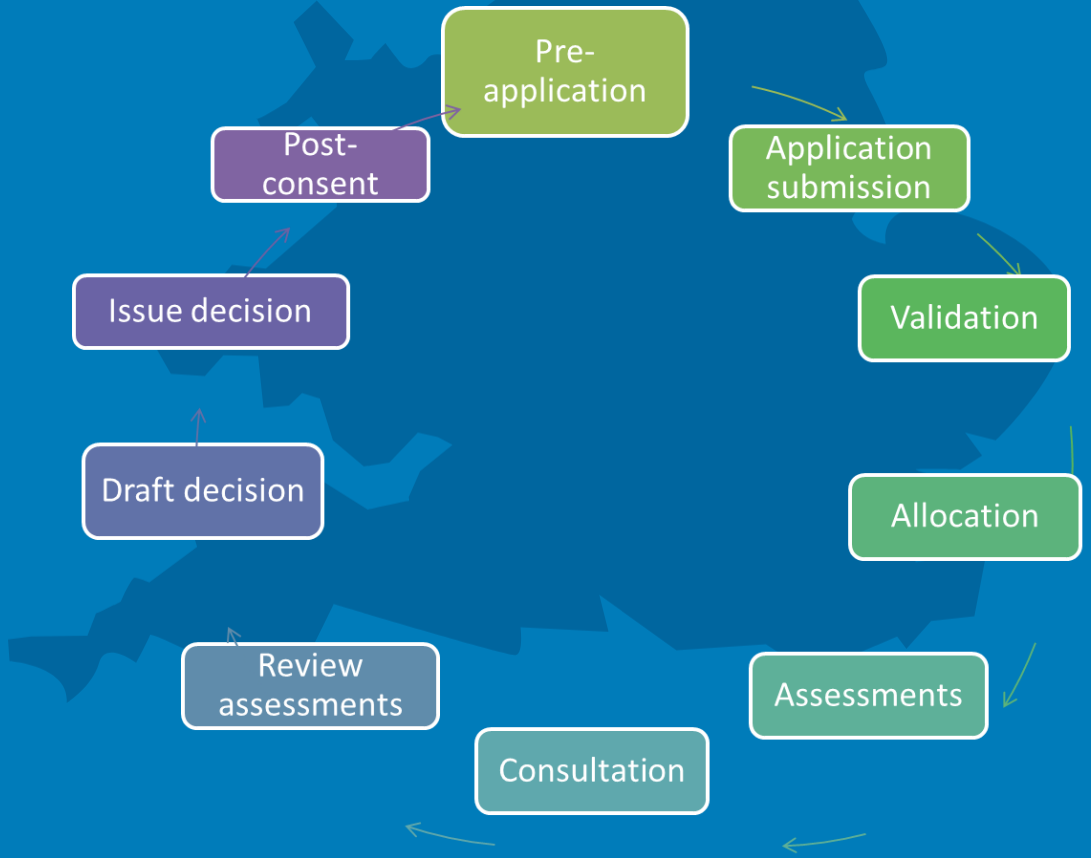
Marine Management Organisation

Marine Licensing Process



Marine Management Organisation

Marine Licensing: Rocket Launches

Mark Qureshi
Marine Licensing Case Manager

Marine Management Organisation

Why do we licence rocket launch activities?

S66 (1) of Marine and Coastal Access Act item 3***: deposit of a substance or object anywhere in the sea or on/under the sea bed from a vehicle, vessel, aircraft, marine structure or floating container which was loaded with the substance or object in any part of the UK***

We are licensing deposit activities

Not just restricted to UK waters

We need to engage with International authorities and organisations

OSPAR Commission; IMO: Other Sovereign States

Marine Management Organisation

Marine Licensing: Rocket Launches

Virgin Orbit – live application

Expected issues for rocket launches:

- Sonic boom – noise
- Jettisoned material – Navigation (Navigation Risk Assessment - MCA)
- Suitability for disposal (Environmental - sensitive location? Cefas, JNCC)

Fee band expected to be Band C (Uncapped @£122 hourly, plus Cefas @ £94.50 hourly)

Marine and Coastal Access Act states any marine licence must not be contrary to International law

Existing and new stakeholders – we are reaching out to other Sovereign States

We are collaborating closely with CAA – to avoid duplication

MMO are an enabling organisation – aiming to work closely with Space Industry

Marine Management Organisation

Thank You

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AEE update

Feedback

Discussion at the last meeting raised several number of issues

More guidance needed	More information would be helpful when preparing the AEE.
Lack of clarity	The form the AEE should take for the purpose of public consultation wasn't clear. Concern that this will cause delays to the overall licensing timeline.
Duplication	There is potential duplication of requirements between the AEE and the requirements of the marine licence.
Scope	There is a need to understand what the AEE scope is for my specific application e.g. distinction between scope of launch and spaceport AEE's.

Actions

Work is underway to address your feedback

1. What we've done	
Improved pre-app	Added two part pre-application workshop
Process improvement	Enhanced initial screen to ensure AEE meets minimum requirements
Published more information	Initial screen checklist and guidance on public consultation guidance

2. We're working on	
Improved pre-app	Full review of pre-application process
Process improvement	Review timelines of AEE assessment with wider licensing process
Update information and publish	Updated pre-application guidance Detailed environmental checklist Review and update AEE guidance

Outcomes

How will this affect my application?

I'm about to submit a pre-application	I can use the guidance published to add further detail to my pre-application form before submitting and…
I have already submitted a pre-application	I have the option to book an additional AEE workshop to improve the accuracy of my AEE before submitting and…
I'm preparing to submit an application	I can use the initial checklist guidance and public consultation guidance to review my application before submitting it to check it meets the minimum information requirements and…
I have already submitted an application	My application will be assessed to ensure it meets the minimum AEE information requirements before moving into to full assessment to prevent delays and…
My application is in full assessment	If relevant my application will also be sent for a marine licence and my AEE documentation will be reviewed to ensure it meets the standards required for public consultation

Longer-term actions

SSRC is a key route to feedback potential longer-term changes needed on the AEE

The statutory guidance for the AEE creates significant requirements for launch and spaceport applicants to fulfil, but is this the most effective way to understand and take account of the environmental impact of launch activities from the UK

The SSRC is tasked with recommending changes in relation to UK commercial spaceflight legislation. It is the maintains dialogue and engagement between the government and the sector.

Launch Liability&Insurance

DfT

Department for Transport

SSRC Workshop on Launch liability and Insurance – 14 June 2022

Considered two proposals – benefits of an upper cap on liability and insurance and dual country licensing

Proposal 1 - Upper flat rate cap

Key outcomes:

- The launch industry value certainty that a planned launch will be insurable – as this facilitates informed investment decisions and pricing for payload customers.
- The MIR approach is competitive compared to just setting a flat rate, but determinations come too late in the licensing process to provide quantifiable certainty on insurance costs.
- Agreement that there is benefit identifying and setting an upper flat rate that strikes a balance of enabling UK to have a competitive offer whilst maintaining appropriate risk sharing with HMG.
- That we should also develop proposals for a class-based approach – rather than a single upper cap.

Questions for SPLOG – what is the level of priority we should assign to taking this work forward? Is there a common critical point that we should aim for?

Proposal 2 - setting insurance and liability cap under dual country licensing

We considered whether, in the case of dual licensing of UK launches, HMG should minimise its risk exposure by setting the UK insurance requirement and cap at the higher of the two country determinations.

Key outcomes were:

- Implications for industry were unclear
- We should discuss alignment of insurance through gov-gov discussion – such as the BiCOSA with US – and other countries where dual country licensing may arise.

LCOLA

LCOLA

Launch Collision Avoidance Analysis is carried out by 18th US Space Command (USSPACECOM) on behalf of operators and is a screening process.

Space Industry Regulations 2021 (Regulation 101, Schedule 1) states that operators should carry out activities taking responsible steps to avoid interfering with other space activities, and to limit major accident hazards.

- This includes the release of any debris or components from their planned activity.

Operators need to identify the following risks:

- Is there a chance that your space object could impact a crewed spacecraft?
- Could your space object impact another operational space object?
- Could your space object collide with debris that can be tracked and potentially avoided?
- Could your space object collide with debris that cannot be tracked?

Payload licensing

Payload licensing in the UK

What do launch operators need to consider

Licensed payloads

In light of the UK's obligations under the UN Treaties, the CAA requires that all payloads to be launched from the UK possess an orbital operator licence. This includes both UK nationals and foreign nationals who may be procuring the launch of their satellite from the UK.

It is important to note that a launch vehicle **will not be permitted to launch if it is carrying unlicensed payloads**. We therefore encourage launch operators to discuss these payload licensing requirements with their payload providers at an early stage.

Orbital operator licences

- **Full Orbital Operator Licences**: authorising both the procurement of the launch and the subsequent operation of the payload in orbit; OR
- **Procurement-Only Operator Licences**: authorising only the procurement of the launch, where the subsequent operation of the payload in orbit is to be carried out under a different jurisdiction and/or by a different person.

Minimum turnaround times for orbital operator licences are typically 6 months – although they may be significantly higher for novel or high-risk orbital missions.

Q&A

AOB

Thank you

caa.co.uk/space