EQUATORIAL LAUNCH AUSTRALIA

ASC Communications Plan

Revision Number: 1.0

Approved by: Michael Jones, Group CEO ELA — BenTett, GM Operations & Launch — Dated: 24 April 2022

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REVISION HISTORY

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ASC COMMUNICATIONS PLAN

1 INTRODUCTION

This document presents the *Arnhem Space Centre (ASC) Communications Plan.* This plan documents the stakeholders, available communications, processes, and guidelines associated with the different aspects of communication required at ASC and for activities leading up to launch, during launch, and recovery/post launch.

2 PURPOSE

The intent of this plan is to articulate what readily available communications will be in place to execute the procedures related to the launch campaign and recovery of the rocket debris and payload, as well as those to be used in emergency situations.

3 OBJECTIVES

The objectives of the communications plan are to:

- Ensure all operations are executed as planned from rocket reception, recovery and return to the client.
- Ensures that there are readily available communications to cope with any/all anomalies
- Maintains positive control of all launch activities from preparation through to recovery
- ELA employees have a clear understanding of the roles, protocols, and the plan in place for the launch communications.
- Easily identify and rectify any gaps in communication systems or procedures
- Ensure safety is kept at the forefront by having a clear, well understood communications plan
- External stakeholders are kept well informed throughout the launch campaign

4 SCOPE

The scope of this communications plan will outline:

a. Available communications and zones areas at ASC
b. Communication systems throughout each phase of the launch campaign
c. Restrictions and limitations
d. Communications process overview and guidelines

5 RELATED DOCUMENTS

This plan is related to or supportive of the following documents.

a. Space (Launches and Returns) (General) Rules 2019,
b. Launch Facility License
c. Launch Permit Application,
d. ELA Emergency Plan,
e. ELA Facilities Management Plan,
f. ELA Technology Security Plan.
g. ASC Operations Manual
h. Launch Management Plan

6 COMMUNICATIONS AT ASC

In support of each launch campaign, communication arrangements for a launch and any connected return, include the following;

- Launch area communications
- Communications from drop zones to the launch area
- Telemetry communications
- Emergency communications

6.1 LAUNCH AREA COMMUNICATIONS

The launch area communications cover all communications instigated from ASC as part of the launch campaign. It encompasses communication between different groups of key stakeholders:

6.2 ELA <> EXTERNAL PARTIES

As part of the numerous approvals and regulatory requirements associated with the licences and the launch permits, ELA communicates with Australian government agencies such as Ministers, the Australian Space Agency, NT Government/Council, Emergency Services, local authorities, Australian and local community organisations, just to name a few. Requirements for government specific communications to these parties can be reviewed in the LMP. Other external communications are conducted with suppliers, contractors, and media outlets as required.

External media communications have been outsourced to an agency who develop the communication strategy, key messaging, communications schedule, and guidelines related to the launches, so whilst they are largely out of scope of this document, they need to be kept well-informed of the launch activities at regular intervals. As such, media communications are governed by a Media Communications Committee (MCC) comprised of ELA, media agency and community stakeholders who meet regularly to discuss and make decisions on messaging and communications. Refer to Appendix A for a broader depiction of ELA's stakeholder map.

6.3 ELA <> CLIENT

ELA and the Client communicate regularly in relation to all planning and execution of the launch and recovery operations, including emergency response and/or accident investigation. On the day of launch, intra-organisational communication follows the chain of command of as identified in the Arnhem Space Centre and ELA Organisational Plan. Communication during the launch phase is predominantly face to face given the client is on-site, in addition to mobile and radio where deemed necessary.

6.4 CLIENT <> CLIENT

The Client has its' own internal communication systems (e.g. email, chat) separate from ELA and this should include their general intra-team conversations. The client in some cases brings their own equipment and infrastructure for communication purposes, which they will execute using their own protocols, however, all operational communications in relation to operational manual and procedures are always conducted using the prescribed ELA communication approaches.

Given the demanding nature of the launch operation and the need for accuracy, all communication conducted by ELA employees should be mindful of these general guidelines:

- Awareness – Communication about when the launch will occur including day and time period.
- Content – Communication must be relevant, meaningful, and at an appropriate level of detail for the relevant stakeholder group.
- Timeliness – Information must be shared in a timely manner to allow stakeholders opportunities to process information and to react.
- Communication Flow – To curb misinformation, official communication will flow through formal communication channels as outlined in this plan, the launch procedures and executed via the chain of commands.

- Confidentiality – Any sensitive material must only be communicated at the direction and approval of the designated and authorised personnel

7 ASC COMMUNICATION ZONES

The Launch Command Centre (LCC) is the central point for the running of the launch procedures, and whereby all commands are issued. A schematic diagram of the overarching infrastructure of the communications nodes and zones depicting the impact ranges/locations and communications available is shown below (Figure 1).

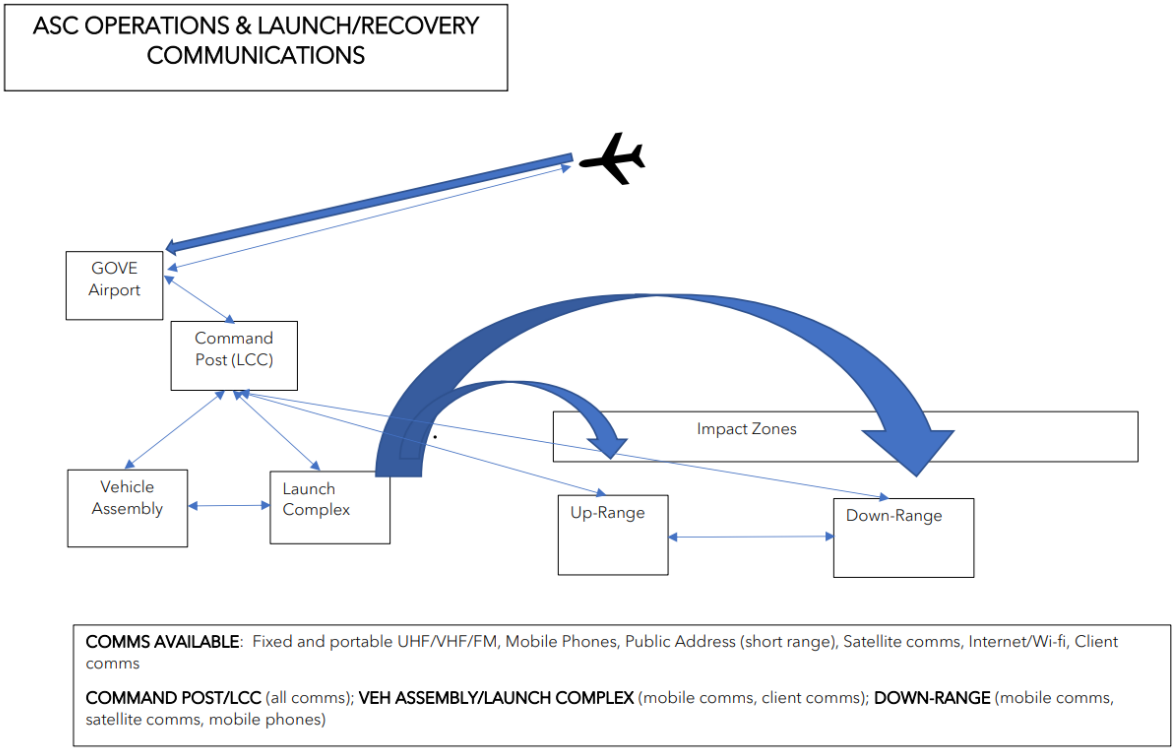


Figure 1: ASC Operations & Launch/Recovery communication zones

7.1 ASC AVAILABLE COMMUNICATION SYSTEMS

On the day of launch, intra-organisational communication shall follow the chain of command of as identified in the Arnhem Space Centre and ELA Organisational Plan. The available communication systems in use at ASC are outlined as follows (refer to the Technology Security Plan for the network architecture design at ASC):

- Internet – to enable email, messaging applications and internet facilitated voice communications (WiFi calling).
- Mobile telephone – to enable internal and external short- and long-range communications to fixed land lines and mobile telephone (where coverage is available).
- VHF/UHF radio communication (fixed and portable) - to enable localised (line-of-sight) up-range and downrange communication.
- Portable satellite telephones - to enable long range (beyond-line-of-sight) communication.
- Public Address (PA) system – to enable site wide messaging in the event of any launch specific radio and mobile frequency restrictions, or as a back-up to the failure of other site-based communications.
- Emergency Position indicating radio beacon (EPIRB) – to help search and rescue authorities find people in distress. When activated, it emits a continuous distinctive radio distress signal for at least 48 hours.

There are also specific client provided comms for specific launch procedures which are mandatory for operational safety.

The primary means for conducting countdown operations is via client provided communication systems, e.g. NASA Roll Away Voice System (RAVS). Communication units are placed at all primary participant locations at the site. RAVS supports several independent commutation channels to limit traffic on the primary countdown channel.

In addition to RAVS, the client may often also provide a Roll Away Timing System (RATS) which distributes countdown time across the range in order to coordinate day of launch activities

It is important to note in addition to the system communications, there are some non-system driven communications available also:

- Signage and safety equipment such as warning lights which are located throughout ASC and are activated during various operating procedures.
- Face to face communication which takes place amongst all stakeholders in a formal and informal capacity.
- Written communications in the form of reports, manuals, letters, memos etc.

The communication approach adopted varies depending on the specific procedure being executed, and those responsible for the procedures are guided by the nature of the procedure and the limits of the procedure.

During launch operations, communications at the ASC site are predominantly achieved by face-to-face, mobile telephone, and via portable VHF/UHF radio as these are the most time-critical means of communicating. Any non time-critical tasks such as obtaining written approvals prior to launch, issuing of documents, reports etc. are suited to email and more generic means of communication.

7.2 Communications From Drop Zones to Launch Area

During recovery operations communications between recovery crews will predominantly be achieved face-to-face, and via portable VHF/UHF radio, whereas communication between recovery crews and the ASC will predominantly be achieved via mobile telephone, and via satellite telephone. Satellite phones will remain with the recovery vehicles, and recovery crews will also be equipped with Emergency positioning indicating radio beacons (EPIRB's).

7.3 Telemetry Communications

The Client is responsible for the Mobile Range Instrumentation and Control Systems to track the vehicle and payload. Depending on the launch motor, clients may use different types of radars and/or GPS systems and are covered off in the launch management plan.

7.4 Emergency Communications

Mobile telephone and Wi-Fi-calling are two independent primary means of external voice communication to Emergency Services. Secondary means of external voice communication to Emergency Services is via the Gulkula Mine using VUHF radios.

During emergency operations, the procedures outlined in the emergency response plan take effect and the Emergency Response Team (ERT) and the Emergency Control Organisation (ERO) are stood up.

Communication between Emergency Response Teams (ERT) is predominantly achieved face-to-face, and via portable VHF/UHF radio, whereas communication between ERTs and the ERO is predominantly achieved face-to-face, mobile telephone, portable VUHF radio and via satellite telephone.

8 COMMUNICATION RESTRICTIONS AND LIMITATIONS

As outlined in the ASC Operations Manual, there are several procedures during launch, recovery, site management and emergency procedures, which call for restrictions on communication nodes to be enacted at various times as part of strict safety protocols; be it hazard driven, by the need to avoid competing/conflicting frequencies, and/or the need to obtain clearances with third-party authorities to secure airspace and marine space before launch. These procedures are tightly controlled from the

LCC by authorised and qualified ELA and client personnel who are responsible for enacting these procedures.

In addition to direct safety restrictions, the geographical span of the recovery operation area which is beyond the line of sight at ASC, also known as “down-range”, drives system limitations on what can and cannot be used.

As can be previously seen in Figure 1, the down-range impact zone could be as far as 200km from the launch pad, so typical mobile comms range is not viable, and other forms of communication such as satellite phones back to LCC and portable radios between recovery crews are needed for these procedures.

Below in Figure 2 is the site map of ASC. The red exclusion zones depict whereby certain communications cannot be used whilst certain procedures are underway (as outlined in the *ASC Operations Manual)*. As an example, mobile communication cannot be used in the red zone when the Pre-Launch Danger Area (PLDA) and Launch Hazard Area (LHA) procedures are underway.

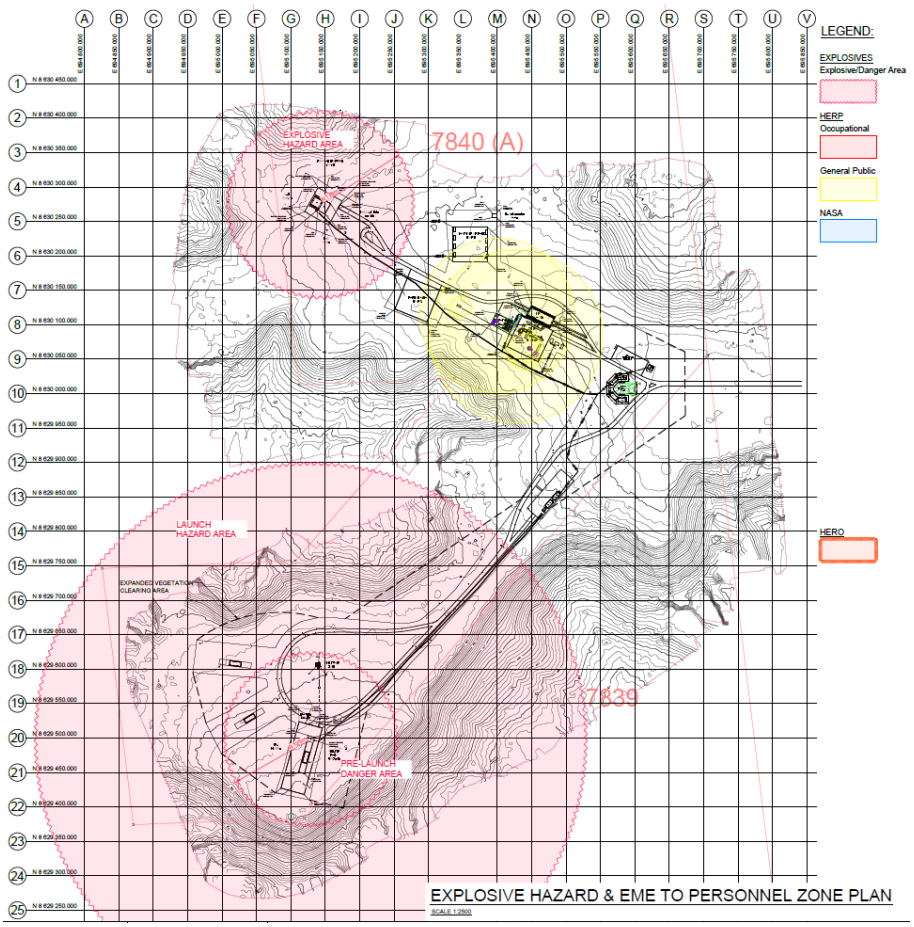


Figure 2: ASC site map depicting communication exclusion areas

9 COMMUNICATION PROCESS

The ASC communications processes support the launch process and subsequent procedures contained within the *ASC Operations Manual.* Figure 3 depicts the launch process including the arrival of systems, preparation of range systems, preparation of LV/payload, launch, recovery, and dispatch of launch systems. The procedures supporting these are detailed in the ASC Operations Manual and outline the step-by-step actions that need to occur and who needs to execute them.

As part of the launch campaign, ELA conducts multiple dress rehearsals with the client to practice and perfect each procedure, which include the testing and trialing of all communication steps in the processes, making adjustments and changes where deemed necessary.

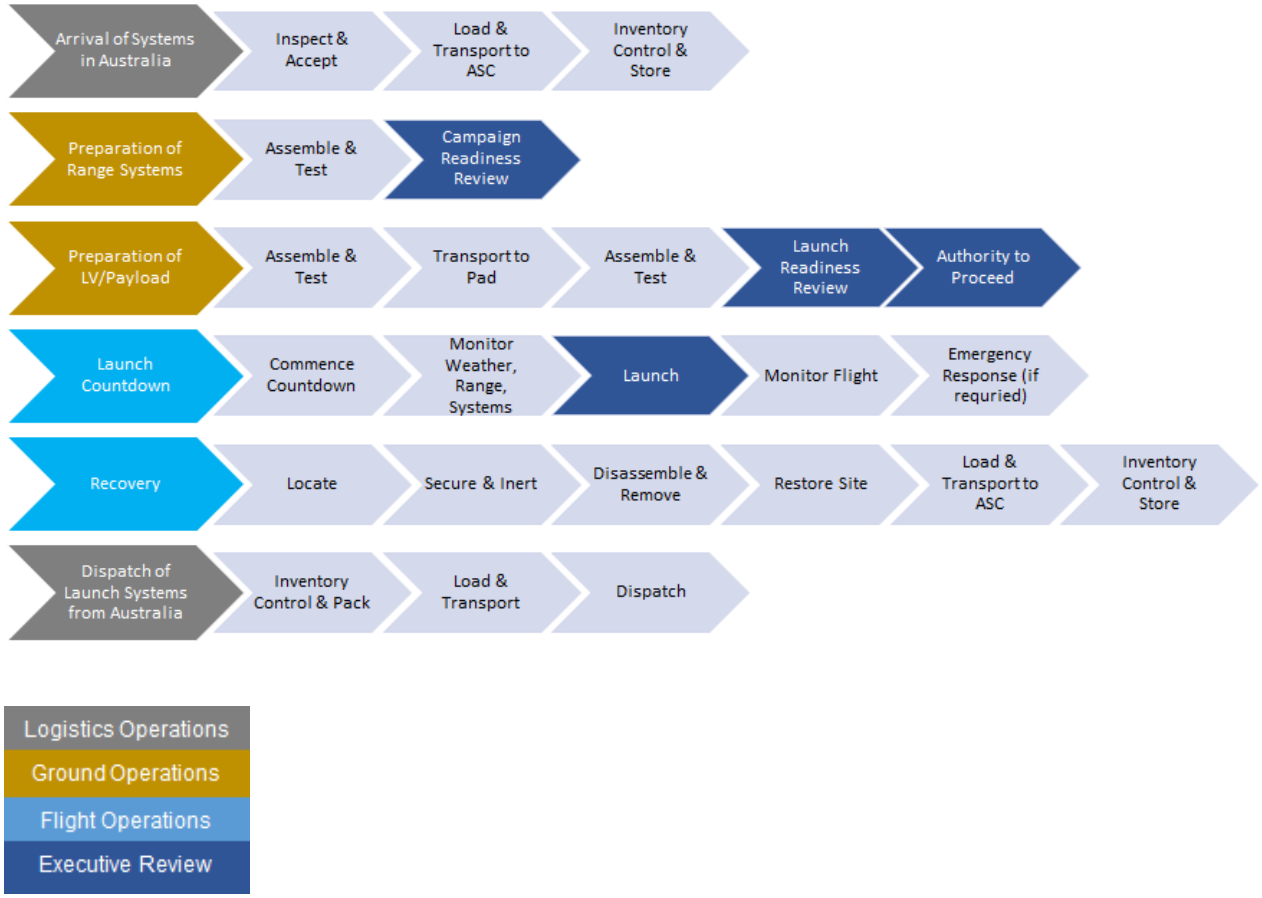


Figure 3: Launch Campaign Operations Procedures Summary

In addition to the above processes, there are also several requirements pertaining to reporting and notification procedures. These are also outlined in the operations procedures, and cover everything from pre/post launch and recovery reporting, NT worksafe reporting, hazardous and explosives reporting, site briefings, data handling, and environmental monitoring (non-exhaustive). Most of these are requirements from various governing or regulatory bodies to satisfy requirements in the launch campaign.

10 COMMUNICATION STANDARDS

ASC has implemented standards for all personnel to abide by and these form part of the site induction training for employees and visitors alike. The following describes the categories that delineate the communications at ASC:

10.1 LAUNCH OPERATIONS

Refers to the forms of communication associated with operational procedures including the entire launch campaign, and any emergency or site management procedures as outlined in the ASC Operations Manual.

Communication during launch operations should always be strictly followed from the operating procedures and the instructions from the LCC given the time-critical nature, and the safety elements which need to be responded to (see exclusions). Emergency procedures also dictate the specific types of communication that are used depending on the nature of the emergency experienced.

10.2 BAU

Communications that are considered as non-operational and are outside of any procedures needing to be enacted within the ASC Operations Manual (including emergency procedures). In such cases,

more general forms of communications are to be used which include face to face, email, MS Teams etc.

10.3 EXCLUSIONS

In certain operational procedures (mostly involving hazardous operations), restrictions are placed on certain forms of communications in accordance with safety/operational rules.

Mobile communication is prohibited as a form of communicating when launch vehicles/payload equipment are being moved in the facility, as an example. As such, the secondary form of nominated communication is used during these procedures (i.e.Public address system). At the conclusion of the procedure, mobile communication is permitted once more. Any instructions pertaining to safety procedures are always issued by the relevant authorised personnel.

The following table prescribes the communication standards for conducting launch operations at ASC.

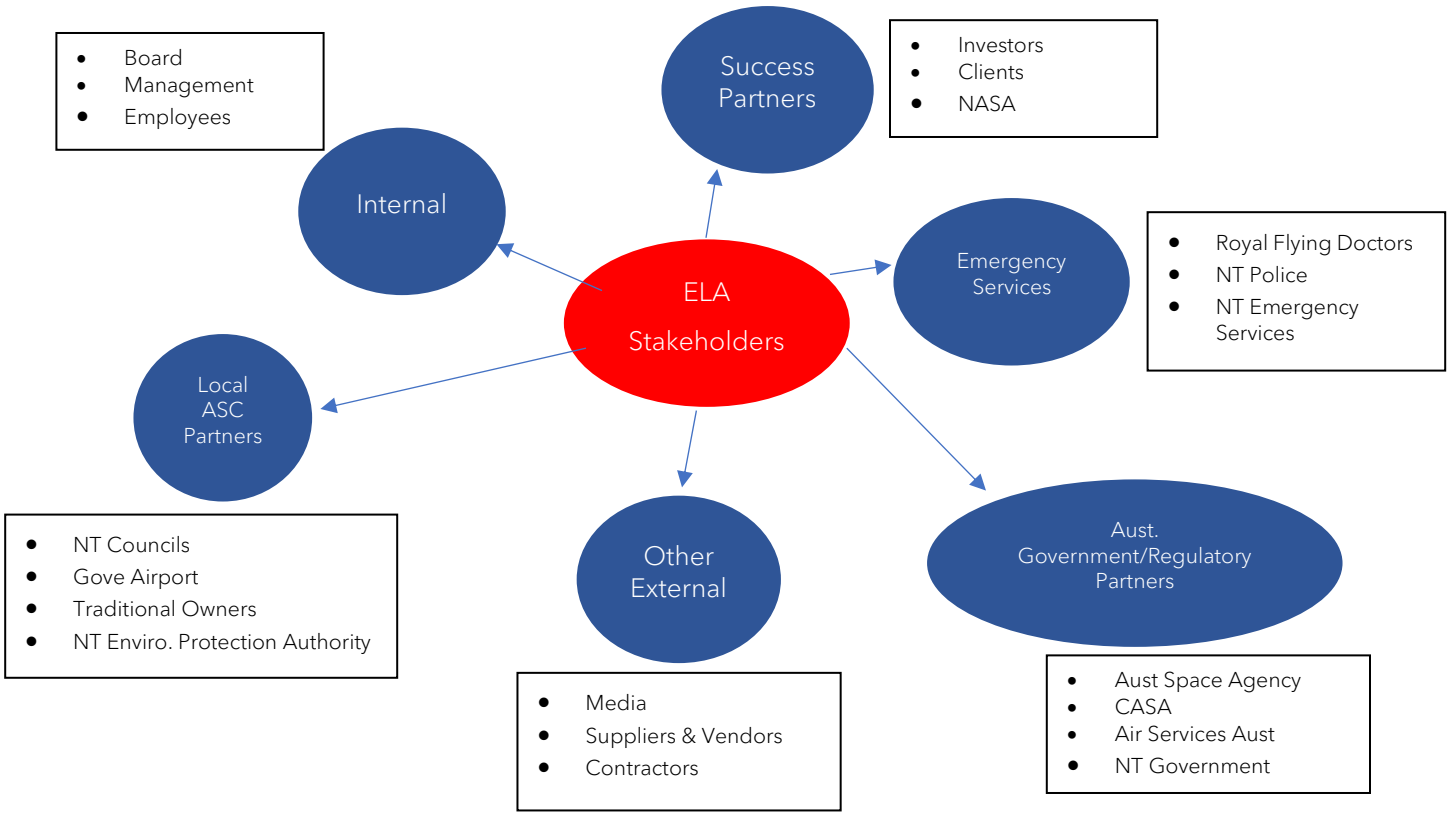
Stakeholders	Nature of communications	Examples	Primary category of comms endorsed	Secondary catgeory of comms endorsed	Equipment/Hardware
ELA to ELA	Launch Operations	All forms of communication associated with operational procedures including the entire launch campaign, and any emergency or site management procedures as outlined in the ASC Operations Manual	Mobile	VHF/UHF Radios	Mobile - BYOD - Telstra SIM ASC supplied radios
	BAU	Communications that are considered as non-operational and are outside of any procedures needing to be enacted within the ASC Operations Manual	Face to face Mobile	Email MS Teams	Internet/Wi-Fi Mobile - BYOD - Telstra SIM
	Exclusions	Authorised forms of communication when restrictions have been put in place during critical procedures (Hazardous operations)	Public Address	VHF/UHF Radios (where permitted by RSO)	PA System ASC supplied radios
ELA <> Client	Launch Operations	All forms of communication associated with operational procedures including the entire launch campaign, and any emergency or site management procedures as outlined in the ASC Operations Manual	Mobile	VHF/UHF Radios Satellite phones	Mobile - BYOD - Telstra SIM ASC supplied radios ASC supplied Satellite phones Client supplied radios
	BAU	Communications that are considered as non-operational and are outside of any procedures needing to be enacted within the ASC Operations Manual	Face to face Mobile	Email MS Teams	Internet/Wi-Fi Mobile - BYOD - Telstra SIM
	Exclusions	Authorised forms of communication when restrictions have been put in place during critical procedures (Hazardous operations)	Public Address Client provided RAVS, RATS	VHF/UHF Radios (where permitted by RSO)	PA System ASC supplied radios Client supplied radios Client supplied lauch comms equipment
ELA<>External	Launch Operations	All forms of communication associated with operational procedures including the entire launch campaign, and any emergency or site management procedures as outlined in the ASC Operations Manual	Mobile	VHF/UHF Radios Satellite phones	Mobile - BYOD - Telstra SIM ASC supplied radios ASC supplied Satellite phones
	BAU	Communications that are considered as non-operational and are outside of any procedures needing to be enacted within the ASC Operations Manual	Mobile Email	MS Teams	Internet/Wi-Fi Mobile - BYOD - Telstra SIM
	Exclusions	Authorised forms of communication when restrictions have been put in place during critical procedures (Hazardous operations)	Satellite phone		ASC supplied Satellite phones

Table 1 ASC Communications Standards

11 REFERENCES

None

12 APPENDIX A: ELA STAKEHOLDER MAP



13 LIST OF ACRONYMS

ASA	Australian Space Agency
ASC	Arnhem Space Centre
BBIX	Black Brant IX
CCB	Configuration Control Board
CEO	Chief Executive Officer
CFU	Carry Forward Unserviceability
ELA	Equatorial Launch Australia
ELP	Engineering Change Proposal
EPA	Environment Protection Authority
FM	Facilities Maintenance Manager
FMP	Facilities Management Plan
GM-OPS	General Manager Operations and Launch
GM-ASC	General Manger Arnhem Space Centre
IMS	Information Management System
LHA	Launch Hazard Area
LSM	Launch Safety Manager
LSO	Launch Safety Officer
NASA	National Aeronautics and Space Administration
NOTAM	Notice to Airmen
NOTMARs	Notice to Mariners
NT	Northern Territory
NTG	Northern Territory Government
PIF	Payload Integration Facility
PLDA	Pre-Launch Danger Area
QMS	Quality Management System
RAAF	Royal Australian Air Force
RMS	Rocket Motor Storage
RSO	Range Safety Officer
VAB	Vehicle Assembly Building
WHS	Work Health and Safety