Model Rocket Drag Race

Launch Operations Procedures

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Launch Operations Procedures

Contents

This document contains one procedure:

- The *Arm and Launch* procedure compromises steps for the igniter insertion, arming, and launching of a model rocket.

Personnel Required

The test operations team consists of four personnel:

1 ☐ The **Operations Director [OPS]** directs operations procedures and communicates with the other test personnel. This should be a core team member.

2 ☐ The **Primary Launch Operator [PRIMARY]** performs actions at the launch site. This may be a participant.

3 ☐ The **Secondary Launch Operator [SECONDARY]** is the backup for **PRIMARY**, and communicates with OPS. If **PRIMARY** becomes incapacitated, **SECONDARY** is responsible for removing them from danger. This should be a core team member.

4 ☐ the **Control System Operator [CONTROL]** operates the test control system, including actuation of remote valves and engine ignition. This may be a participant.

Sign-Off

To be completed by all test personnel after reading and familiarization with procedures

1 ☐ **Operations Director [OPS]** _____ _____

2 ☐ **Primary Launch Operator [PRIMARY]** _____ _____

3 ☐ **Secondary Launch Operator [SECONDARY]** _____ _____

4 ☐ **Control System Operator [CONTROL]** _____ _____

Prior to Start

- ☐ Ensure that the following procedures are complete:
    - ☐ Rocket Assembly procedure
    - ☐ RLCS Setup procedure
- ☐ Ensure that all personnel as defined above are available and have completed the sign-off.

Prior to Arm and Launch

- ☐ Ensure that **PRIMARY** and **SECONDARY** are wearing safety glasses.
- ☐ Ensure that **PRIMARY** is in possession of an igniter and a plug.
- ☐ Ensure that **OPS** is in possession of the system control key.
- ☐ Ensure that the rocket is at the launch site.
- ☐ Confirm that there are no fire hazards within the testing area.
- ☐ Confirm that the cameras are set up at the correct locations.

Arm and Launch

- ☐ **OPS**: Give the system control key to **PRIMARY**.
- ☐ **PRIMARY** and **SECONDARY**: Approach the launch site.
- ☐ **PRIMARY**: Insert the system control key into towerside and rotate through 90 degrees, disarming the system.
- ☐ **SECONDARY**: Confirm that the ignition wires are not connected to the engine
- ☐ **SECONDARY** Confirm that the ignition wires are not connected to RLCS.
- ☐ **SECONDARY**: Confirm that there are no personnel present in the testing area other than **PRIMARY** and **SECONDARY**.
- ☐ **PRIMARY**: Insert the igniter into the bottom of the engine as deep as possible, spreading the leads. Insert the plug to hold the igniter in place.
- ☐ **PRIMARY**: Load the rocket onto the launch rail.
- ☐ **PRIMARY**: Connect the ignition alligator clips to the igniter leads. Confirm that the leads are not shorted.
- ☐ **PRIMARY**: Connect the ignition connector to the RLCS ignition cable.
- ☐ **PRIMARY**: Remove the system control key from towerside, arming the system.
- ☐ **PRIMARY** and **SECONDARY**: Retreat to the mission control area.
- ☐ **PRIMARY**: Give the system control key to **OPS**.
- ☐ **CONTROL**: Confirm that all actuator controls are in the "off" position:
    - ☐ Primary Ignition
    - ☐ Secondary Ignition
- ☐ **OPS**: Poll the following personnel for GO/NO GO status:
    - ☐ **SECONDARY**

19 ☐ **PRIMARY**
20 ☐ **CONTROL**
21 ☐ **OPS**: Give the system control key to **CONTROL**.
22 ☐ **CONTROL**: Insert the system control key into clientside and rotate through 90 degrees, arming the system.
23 ☐ **CONTROL**: Perform the engine startup procedure:
24 ☐ Arm the Primary Ignition switch.
25 ☐ Hold down the Fire button until launch is observed.
- In the event of a failed ignition (launch not observed within 5 seconds):
26 ☐ **CONTROL**: Disarm the primary ignition switch.
27 ☐ **CONTROL**: Give the system control key to **PRIMARY**.
28 ☐ **PRIMARY** and **SECONDARY**: Approach the launch site.
29 ☐ **PRIMARY**: Insert the system control key into towerside and rotate through 90 degrees, disarming the system.
30 ☐ **PRIMARY**: Disconnect the ignition connectors from the RLCS ignition cable.
31 ☐ **OPS**: Abort test procedures and investigate.
32 ☐ **ALL**: Observe the launch.
33 ☐ **PRIMARY** and **SECONDARY**: Approach the launch site.
34 ☐ **PRIMARY**: Disconnect the ignition connectors from the RLCS ignition cable.
35 ☐ **OPS**: Proceed with teardown and disassembly.