**University of Hull Astrodome.**

**Inflatable Planetarium Standard Operating Practice.**

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**Overview.**

The planetarium which has been purchased for the University of Hull is a 6m class inflatable and portable teaching and learning aid. The intention is to use it both on and off campus in STEM related outreach activities.

**Equipment.**

Prior to use, demonstrators must ensure that all the key items of equipment are present, and similarly when packed away. These items include:

* Planetarium
* Trolley
* Table
* Air blower / fan
* Newtonian Projector and Mirror system
* Speakers
* Square Mirror and stand to attached to Newtonian
* Extension cable
* Power cables for projector, laptop and speakers
* HDMI cable (laptop to projector)
* Audio cables
* Lights for inside

The planetarium itself is 6m in diameter and as such, covers an area of approximately 28m2. This will hold about 25 seated adults. Given that the dome is not a perfect circle thanks to the entry/exit point, a footprint of 7m diameter is required to set up the dome.

It is 3.6m in height. This limits where it can be used, sites identified on campus are Asylum in the Student Union, the Lindsay Suite of Staff House and the Brynmor Jones Library exhibition space.

Outdoors locations can be used, but the conditions must be ideal for this: no wind, bone dry grass and use of a tent tarp to cover the floor fully. This mode of operation is not generally recommended and should not be undertaken without additional training of personnel.

**Standard Set-up Procedure.**

* Clear a suitable area that is large enough for the dome itself. Check the surface has no sharp object on it and if necessary, sweep the floor if it is not clear.
* Plug in the air blower, ensuring the switch is in the off position.
* Unpack and unfurl the planetarium into a circular shape, aligning the air flow pipe with the blower before connecting the two securely using the Velcro from the dome.
* Ensuring the entrance is zipped shut, turn the blower on and monitor the dome as it inflates.
* Inside the dome, keep the door zipped shut and use the portable lights.
* Once inflated, assemble the inner equipment. This includes the mirror and projector on the table, laptop  and speakers on the hard case beside this. Tape off an area around this for safety. People are to be kept out of this area to protect any accidental damage to the equipment or visitors.

**Running shows.**

At all times, there must be 1 demonstrator outside of the dome to control numbers and the fan, and 2 demonstrators inside to run the show and control behavior of visitors.

Urquhart and Pimbblet will maintain an official database of demonstrators who have been trained and are authorized to run shows and work with the planetarium.

If the visitors are a school group, then 1 person inside the dome must be a teacher or parent to act in loco parentis. This person, if able bodied, can aid in evacuations should the need ever arise, but must be advised of the correct procedure, below.

Visitors must remove footware and leave any food or drink outside of the dome.

At most, 15 young people, or 10 adults are to be permitted entry in a single batch, entering in single file. After this, the dome must be allowed a short amount of time to partially re-inflate.

**Planetarium Take-down**

* When cleared of the audience, switch off projector, laptop and speakers. Pack mirror away into the hard case, place cap on projector. All of these items are to be placed in to their appropriate boxes and packed on to the trolley for transportation.
* Turn off lights and fan.
* Detach the fan from the dome and pack away the fan.
* Remaining boxes to be carried back since they are light and easily moved.
* To speed up deflation, the vents near the inlet pipe can be opened.
* The dome must then be flattened – get on hands and knees to push the remaining air out of the dome.
* The dome should then be packed away following the inverse of the set-up: fold the sides to made a large rectangle with the main exit at one of the short sides. Then roll up the rest of the fabric before putting back inside its protective carry-bag.

**General Safety Precautions.**

* Wires must be tucked away as much as possible under the skirting of the dome and warnings given by demonstrators to visitors to avoid this area to prevent accidental trips.
* No food, no drink and no shoes are permitted inside the dome. They must be removed prior to entry. The dome can also warm up during use, hence visitors can be advised to remove coats and jumpers too.
* Do not touch the projector bulb.
* Check all connections.
* Give suitable warnings regarding, for example, claustrophobia (as outlined  in the risk assessment).

**Emergency Procedures.**

There are 3 broad scenarios for emergency procedures.

The first is when the dome needs to be evacuated due to external events, such as a fire alarm in the building that the dome is situated in.

The second is a failure of dome inflation.

The third is the presence of fire or smoke within or on the dome itself.

In the first case, visitors should leave in single file via the main exit in an orderly fashion. One of the demonstrators inside the dome is to lead the way out, and the second demonstrator should be the last to leave, ensuring nobody remains inside the dome. There is ample time to do this without causing the dome to deflate due to everyone exiting in one batch.

If there are any wheelchair bound visitors inside the dome, then they should leave last. The procedure for their exit is for the dome edge (or lip) to be lifted up, allowing them to go underneath the lip of the dome and out. One or two demonstrators will be required to execute this procedure. The reason why they have to be the final person out is that lifting the lip of the dome causes a much more rapid deflation than exiting through the standard air-lock exit.

The fan should be switched off once everyone is safely out.

In the second case, the procedure is identical to the first, however, the person on the outside of the dome should ensure that it is safe to exit prior to visitors coming out. This includes switching the fan to the off position if the fan is suspected of being at fault. If the main exit is unsafe to use, then exit must be made by lifting up the outer lip of the dome, as advised below.

In the third case, exit should be made by flipping the lip of the dome immediately and all visitors sliding under the edge of the dome. The dome will rapidly deflate by following this procedure; hence the internal and external demonstrators must act quickly if there is any smoke or fire within the dome itself.

If there is any choice as to the location for the dome to be flipped, demonstrators are advised to lift the lip opposite to the main air inflow pipe – i.e. opposite to the main exit and away from the fan.