NOTICE: An important CHANGE to the 2010 hydraulic/pneumatic /compressed gas specifications

BACKGROUND: Recently, members of the MATE competition technical advisory committee expressed concerns about the use of hydraulic fluids and compressed air. Our premise is that, as with electricity, these are powerful energy sources, and MATE is dedicated to a "safety first" philosophy. After much consideration, about the compressed air regulations, we have elected to make the following changes and clarifications.

The technical advisory committee recognizes this may adversely impact your team's vehicle and/or project management, but they are necessary for safety reasons. This is not open for discussion or waivers.

DETAILS: The power specification from Page 4 NON-ELECTRICAL to Page 5 MONITORS of the Design & Building Specifications and Competition Rules document is replaced with the following specification update. This information will supersede any pneumatic/hydraulic specifications in the original specification.

Hydraulic/compressed air/gas specifications for 2010 EXPLORER and RANGER class non-electrical power sources:

1) No hydraulic or compressed air in the form of stored energy is allowed prior to the start of a team's competition mission run(s).

2) Teams may use storage tanks for air or hydraulic oil, which can be energized at the beginning of their mission run(s).

3) Teams can use compressed air or auxiliary hydraulic power, but must generate it at the start of their mission run(s).

4) In this context, the start of the mission run is defined as the five minute setup time at the start of the mission.

6) All storage of air or hydraulic pressure must be reduced to zero psi at the end of the mission and before the equipment is moved. This is included in the team's shutdown time.

7) Hydraulic: Oil, water or other liquids. Maximum PSI: 150

Fluid: Any fluid used must be Biodegradable Food Grade or water.

A Material Data Safety Sheet must be provided at the safety inspection showing the type of oil used and it's compatibility with the Biodegradable Food Grade specification. Teams using water do not need to provide a MDS for water.

Hydraulic lines: All lines and fittings must be rated for a minimum pressure of 300 PSI.

7) Pneumatic: Compressed air or inert gas. Maximum PSI: 40 Pneumatic lines: All lines and fittings must be rated for a minimum of 100 PSI.

8) Exception to the surface supply rule

Hydraulic systems utilizing water and an on-board ROV pump are allowed, with the maximum rating of 150psi. These systems must show a minimum pressure rating of twice the maximum pressure generated by the on-board pump.

9) Hydraulic and/or pneumatic pressure generation

In order to create pressure in such hydraulic and/or pneumatic systems from an electrically-driven pump, MATE will provide one GFI protected outlet with a nominal 115V AC (60 Hertz) and 15 amps maximum. This outlet is intended to provide power for pumps and surface support equipment (e.g. video monitors & control boxes). This AC power source CANNOT be used to directly or indirectly power thruster motors. If hydraulic or pneumatic power is used for thrusters, the power for the pump must come from the MATE supplied power supply for that class.

10) In addition to electric pumps, hydraulic and pneumatic systems can be powered by hand or foot pumps (e.g. bicycle tire pump).

11) Pressurized cylinders

Pressurized cylinders must meet the following specifications:

* Approved by US DOT (Department of Transportation) or TC (Transport Canada).

* Have a current inspection/test sticker and/or stamp. (See MATE competition web site, Design Specs & Mission section, for examples.)

* Stamped with the maximum allowable pressure.

* Contain a safety relief device.

* They may be not be filled until the start of the mission.

* Cylinders must be secured in a safe manner such that they will not fall or roll around. If the judges feel that a cylinder is unsafe, they have the discretion to prevent its use.

* SCUBA tanks are permitted. They must meet all the above specifications and they may only be filled to a maximum 40psi after the start of the mission. SCUBA tanks must also have the standard dive inspection and fill permit stickers.

12) Pressure storage devices (pressure accumulators) Pressure storage devices are allowed on the ROV if they meet the following requirements:

* Maximum volume stored is 1 Liter.

* Designed or rated to handle a maximum pressure of 100 psi if pneumatic and 300 psi if hydraulic.

13) Accumulator Design

It is recognized that a team might not be able to purchase a pressure accumulator that has the proper rating and fits in the space needed. In that case, the team must show that their designed accumulator is capable of withstanding the specified pressures without rupture. In no case will PVC or ABS based devices be approved as pressure accumulators or storage devices..

14) Power shutdown requirement

It is possible that, through the use of capacitors and/or pressure accumulators, an ROV could continue to function long after it was disconnected from the surface supply. For safety purposes, any ROV that is disconnected from the surface supply must stop functioning in less than 5 seconds. Any filter capacitors or accumulators must be sized accordingly to meet this specification.

15) MATE support

In an attempt to alleviate the burden that these regulations may place - and to save teams the financial and logistical costs of shipping storage tanks or air compressors to Hawaii - the MATE Center is offering to provide a source of compressed air. Any compressed air provided by MATE will be regulated at 40 PSI. **If your team would like to take advantage of this offer, please contact Jill Zande, the MATE Center's competition coordinator, at jzande@marinetech.org or (831) 646-3082 AS SOON AS POSSIBLE.**