

## Senior Design Engineers Hazard Assessment Form

Team Number: 8

Date assessment completed:

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### Project Summary

Project Crayowulf intends to create a mini-supercomputer system with a mechanical enclosure and liquid cooling system. The mechanical enclosure will be made from metal and 3-D printed materials. The enclosure fabrication will involve cutting, welding, machining, etc.. The liquid cooling system will likewise involve metal parts that need to be machined.

### Exposure and Protective Equipment Assessment

	Questions	Sample activities	Resulting hazards
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Are there activities that produce flying fragments, objects or particles?	Cutting, Milling, CNC (Machine Shop Tools)	<b>Impact</b> from flying metal
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	Does the layout of the workplace and/or location of co-workers present a potential risk of injury? (congested area, flammable materials nearby)		
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Do you observe any sources of objects that might pierce the feet or cut the hands?	Machine Shop Equipment	<b>Penetration</b> of nails, screws, sheet metal, saw blade
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	Are there any sources of rolling or pinching objects that could crush the feet?		
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Are there twirling blades or parts that could cut or entrap body parts?	Sawing, drilling	<b>Laceration</b> from sharp edges rotating
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	Is there potential for injury to the head from falling objects, moving objects or electrical conductors?		
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Is there actual or potential exposure to chemicals?	Spray Painting	<b>Chemical</b> – eye irritation, fumes
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Are there any sources of high temperatures that could cause burns, eye injury, ignition of protective equipment or heat stress?	Welding	<b>Heat</b> , ie. hot sparks, splash, hot surfaces, sunburn
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Are there any sources of harmful dust?	Grinding/sanding	<b>Harmful dust</b> , ie. metal dust
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Are hands exposed to lacerations or abrasions?	Cutting and sanding	<b>Laceration</b> , abrasion
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Are there any sources of light radiation?	Welding	<b>Light (optical) Radiation</b> , ie. Intense radiation, glare
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Are there any electrical hazards?	Electrical wiring, circuitry, power supply	<b>Electrical hazards</b> including working with power supply wiring
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	Is there exposure to biological hazards?		
<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	Are there potential fall hazards?		
<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Are there excessive noise levels?	Machine Shop Equipment	<b>Noise exposure</b>

## CHEMICAL HAZARDS

Chemical Type	Present	Task/Job	Affected area (mark all that apply)
Compressed gas	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Shop Compressed gas hose	<input checked="" type="checkbox"/> eyes <input type="checkbox"/> lungs <input checked="" type="checkbox"/> skin
Carcinogen	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Welding Fumes	<input type="checkbox"/> eyes <input checked="" type="checkbox"/> lungs <input type="checkbox"/> skin
Corrosive	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N		<input type="checkbox"/> eyes <input type="checkbox"/> lungs <input type="checkbox"/> skin
Cryogenic	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N		<input type="checkbox"/> eyes <input type="checkbox"/> lungs <input type="checkbox"/> skin
Flammable/Combustible	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Spray Paint	<input checked="" type="checkbox"/> eyes <input checked="" type="checkbox"/> lungs <input type="checkbox"/> skin
Highly Toxic	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N		<input type="checkbox"/> eyes <input type="checkbox"/> lungs <input type="checkbox"/> skin
Irritant	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Welding Fumes	<input type="checkbox"/> eyes <input checked="" type="checkbox"/> lungs <input type="checkbox"/> skin
Pesticide	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N		<input type="checkbox"/> eyes <input type="checkbox"/> lungs <input type="checkbox"/> skin
Pyrophoric	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N		<input type="checkbox"/> eyes <input type="checkbox"/> lungs <input type="checkbox"/> skin
Sensitizer	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N		<input type="checkbox"/> eyes <input type="checkbox"/> lungs <input type="checkbox"/> skin
Water Reactive	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N		<input type="checkbox"/> eyes <input type="checkbox"/> lungs <input type="checkbox"/> skin

Please use the chart below to indicate (check) what areas are affected by the identified hazards.

### HAZARD SUMMARY

Hazard	Eye/face	Head	Hand	Skin	Foot	Lungs	Hearing
Impact	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Penetration	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Compression or "roll-over"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Laceration or Abrasion	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chemical	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Heat	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Harmful dusts	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Light (optical) Radiation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electrical hazards	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Disease transmission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Slips, Trips or Falls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Noise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

For each of the boxes checked in the hazard summary above, please indicate how your team members will be protected (i.e., type of PPE, isolation of hazard, distance from hazard, etc.).

Hazard	Protection Measure
Impact	Safety Glasses, Work Gloves (when appropriate)
Penetration	Safety Glasses, Work Gloves (when appropriate)
Laceration or Abrasion	Work Gloves if appropriate
Chemical	Safety Glasses, Filtration Mask
Heat	Welding Mask, Welding Gloves
Harmful Dusts	Avoid dusting metal off with hands – used compressed air, Gloves if necessary
Light Radiation	Welding Mask, Welding Gloves
Electrical Hazards	Disconnect Power when possible, Properly Ground
Noise	Hearing protection – Earplugs/Headphones