

KCMC Biotechnology Laboratory	STANDARD OPERATING PROCEDURE	Effective Date 6 Dec 2006	SOP-Number EQP.008
		Page 1 of 5	Date 6 December 2006
Title: GENERATOR SAFETY & MAINTENANCE			

Author/Date: Anne Morrissey, November 2006
Approvals/Date: <div style="text-align: center;"> _____ John, A. Crump, MB, ChB, Laboratory Director </div>

This SOP has been read and understood by:

Name	Date
Signatures on original copy filed in office.	
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

Annual Review	
By	Date

**KCMC Biotechnology
Laboratory**

**STANDARD
OPERATING
PROCEDURE**

Effective Date
6 Dec 2006

SOP-Number
EQP.008

Page 2 of 5

Date
6 December 2006

Title: GENERATOR SAFETY & MAINTENANCE

Document History:

Version Number	Reason for Changes	Date

Copies distributed to:

Name	Date

Title: GENERATOR SAFETY & MAINTENANCE

PURPOSE

Description of safety precautions, routine operation and maintenance procedures to follow to keep generator in good running order.

SCOPE

Procedures for safe maintenance of Biotechnology Laboratory generator apply to designated, trained personnel in the KCMC Engineering Department and service technicians.

EQUIPMENT

Generator: Menag Energie GMBH Stromaggregate Model XP100E

Engine: Perkins 1000 series

PERSONAL PROTECTIVE EQUIPMENT

Protective Coat (knee length) or Overalls

Safety Glasses

Gloves (hardware)

SAFETY PRECAUTIONS

Fire and Explosion Prevention:

1. Ensure the generator area is properly ventilated.
2. Keep the room, floor and generator clean.
3. Clean spills of fuel, oil, battery electrolyte or coolant immediately.
4. Never store flammable liquids near the engine.
5. Store any oily rags in a closed container.
6. Do not smoke or allow sparks, flames or other sources of ignition around fuel or batteries. Fuel vapors and hydrogen gas escaping from charging batteries are explosive.
7. Do not fill the fuel tank while the engine is running.
8. Do not attempt to operate the generator with any known leaks in the fuel system.

Mechanical:

1. Do not attempt to operate the generator with the safety guards removed and do not reach around or under the safety guards while generator is running..
2. Keep hands, arms, long hair, loose clothing and jewelry away from moving parts, belts or pulleys. **Attention: Some moving parts cannot be seen when generator is running.**
3. Keep access doors closed and locked when not required to be open.
4. Avoid contact with hot oil, hot coolant, hot exhaust gases, hot surfaces and sharp edges and corners.
5. Wear protective clothing including sturdy work gloves when working around generator.

Title: GENERATOR SAFETY & MAINTENANCE

Chemical:

1. Avoid skin contact with fuel, oil, coolant, lubricants or battery electrolyte. If skin contact occurs, wash with soap and water.
2. Do not wear clothing that has been contaminated with fuel or lube oil.

Electrical:

1. Ensure that the generator is properly grounded.
2. Do not touch electrically charged parts and/or interconnecting cables with any part of the body or with any non-insulated conductive object.
3. Disconnect the battery cables before any manipulation of the electrical system.

MATERIALS USED

Battery 12V/Battery rack
Air filter Elements
Lubricating oil
Diesel Fuel
Basic tools

GENERAL MAINTENANCE

1. Maintenance and service should only be carried out by qualified technicians.
2. Generator will start operating automatically when power is interrupted; switch off control panel before performing any maintenance procedures. Check that the control switch /key is off.
3. All preventive maintenance should be documented.
4. The generator should be kept clean. Surfaces may be cleaned with an aqueous industrial cleaner. Do not use flammable solvents for cleaning purposes.
5. Do not permit liquids such as fuel or film to accumulate on any internal or external surfaces or on, under or around any acoustic material.
6. Any acoustic material with a protective covering that has been torn or punctured should be replaced immediately to prevent accumulation of liquids or oil film within the material.

EQUIPMENT	FREQUENCY	MAINTENANCE
GENERATOR UNIT	EVERY 2 WEEKS	Start and run generator for 5 minutes if unit has not been run.
	MONTHLY	Start and run generator on 50% load for 1-2 hours if unit has not been run.
	EVERY 6 MONTHS	<ul style="list-style-type: none">• Check all control system safety devices by electrically simulating faults.• Clean battery cap vents.• Tighten all exhaust connections• Tighten all electrical connections

KCMC Biotechnology Laboratory	STANDARD OPERATING PROCEDURE	Effective Date 6 Dec 2006	SOP-Number EQP.008
		Page 5 of 5	Date 6 December 2006
Title: GENERATOR SAFETY & MAINTENANCE			

		<ul style="list-style-type: none"> • Start engine and observe that instrument panel and gauges are operating properly • Remove and clean spark arrestor to remove carbon buildup.
ENGINE	WEEKLY	<ul style="list-style-type: none"> • Check coolant. • Check level of lubricating oil. • Check lubricating oil pressure at the gauge. • Clean the air cleaner or empty the dust bowl of the air filter if conditions are extremely dusty.
	EVERY 6 MONTHS	<ul style="list-style-type: none"> • Check condition and tension of drive belt. • Check for water in the pre-filter. • Renew the canister of the lubricating oil filter. • Clean the air filter. • Clean the compressor air filter. • If a coolant inhibitor is used instead of antifreeze, change. • Perform a winding insulation test on alternator. • Inspect alternator air filters and clean if necessary.
	YEARLY	<ul style="list-style-type: none"> • Check concentration of coolant. • Clean the sediment chamber and the strainer of the fuel lift pump. • Renew elements of fuel filter. • Check Stanadyne fuel injection pump for governor operation. • Clean alternator unit. • Change the engine lubricating oil. • Renew the canisters of the lubricating oil filter. • Clean and/or renew air filter element. • Check valve tip clearances and adjust if necessary.
	EVERY 2 YEARS	<ul style="list-style-type: none"> • Renew antifreeze. • Check atomizers. • Clean engine breather system. • Clean turbocharger impeller and compressor casings. • Check that exhaustor or compressor is checked. • Check alternator and starter motor.

Appendix A: WEEKLY GENERATOR MAINTENANCE LOG SHEET

Appendix B: MONTHLY/ANNUAL GENERATOR MAINTENANCE LOG

REFERENCE

Technical Operation and Maintenance Manual. 2002. MENAG ENERGIE GMBH
STROMAGGREGATE. XP100E. 5002791/0010