ANNEX E

Material Safety Data Sheet

Jet A-1

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*                        M S D S                          *
*                                                         *
*  Canadian Centre for Occupational Health and Safety     *
* * * * * * * * * * * * Issue : 2001-4 (November, 2001)  *

                        *** IDENTIFICATION ***

MSDS RECORD NUMBER       : 2857357
PRODUCT NAME(S)          : KEROSENE TYPE AVIATION TURBINE FUEL
                           ESSO TURBO FUEL A
                           ESSO TURBO FUEL A-1
                           ESSO JET A
                           ESSO JET A-1
                           JET A
                           JET A-1
                           TURBO FUEL A
                           TURBO FUEL A-1
                           TURBO FUEL A-1 F34
                           TURBO FUEL A-1 JP8
                           JET A-1 <FSII>
                           CAN/CGSB-3.23 GRADE F34
PRODUCT IDENTIFICATION   : MSDS Number: 08525
DATE OF MSDS             : 2001-04-27
CURRENCY NOTE            : This MSDS was provided to CCOHS in
                           electronic form on 2001-09-12

                     *** MANUFACTURER INFORMATION ***

MANUFACTURER             : Imperial Oil (Products Division)
ADDRESS                  : 111 St Clair Avenue West
                           Toronto  Ontario
                           Canada    M5W 1K3
                           Telephone:  416-968-4111

                *** SUPPLIER/DISTRIBUTOR INFORMATION ***

SUPPLIER/DISTRIBUTOR     : Imperial Oil (Products Division)
ADDRESS                  : 111 St Clair Avenue West
                           Toronto  Ontario
                           Canada    M5W 1K3
                           Telephone:  416-968-4111

                        *** MATERIAL SAFETY DATA ***


   Date Prepared: April 27, 2001
   Supersedes: April 29, 1998
   MSDS Number: 08525

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1. PRODUCT INFORMATION

   Product Identifier: KEROSENE TYPE AVIATION TURBINE FUEL
                       ESSO TURBO FUEL A
                       ESSO TURBO FUEL A-1
                       ESSO JET A
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ESSO JET A-1
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TURBO FUEL A-1 F34
TURBO FUEL A-1 JP8
JET A-1 <FSII>
CAN/CGSB-3.23 GRADE F34

Application and Use:
Aviation turbine fuel

Product Description:

A mixture of aliphatic and aromatic hydrocarbons and additives.

REGULATORY CLASSIFICATION

WHMIS:
Class B, Division 3: Combustible Liquids.
Class D, Division 2, Subdivision A: Very Toxic Material.
Class D, Division 2, Subdivision B: Toxic Material

CEPA: CANADIAN ENVIRONMENTAL PROTECTION ACT
All components of this product are either on the Domestic Substances List (DSL), exempt, or have been notified under Section 26 of CEPA.

TDG INFORMATION (RAIL/ROAD):

Shipping Name: FUEL, AVIATION, TURBINE ENGINES
Class: 3
Packing Group: III
PIN Number: UN1863

Please be aware that other regulations may apply.

TELEPHONE NUMBERS

Emergency 24 hr. (519) 339-2145
Technical Info. (800) 268-3183

MANUFACTURER/SUPPLIER:

IMPERIAL OIL
Products Division
111 St Clair Avenue West
Toronto, Ontario
M5W 1K3
(416) 968-4441

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2. REGULATED COMPONENTS

The following components are defined in accordance with sub-paragraph 13(a)(i) to (iv) or paragraph 14(a) of the Hazardous Products Act:

NAME	%	CAS #

Kerosene, straight run	0-100 V/V	8008-20-6	LD50:>5g/kg,oral,rat
Ethylene Glycol Monomethyl Ether	0-0.15 V/V	109-86-4	LD50:2.4g/kg,orl,rat LD50:0.8g/kg,orl,rab

3. TYPICAL PHYSICAL & CHEMICAL PROPERTIES

Physical State: Liquid
Specific gravity: not available
Viscosity: 8.00 cSt at -20 deg C
Vapour Density: 4
Boiling Point: 205 to 300 deg C
Evaporation rate: not available (1= n-butylacetate)
Solubility in water: NEGLIGIBLE
Freezing/Pour Point: -47 deg C ASTM D2386
Odour Threshold: 0.552mg/m3
Vapour Pressure: 4 kPa at 38 deg C
Density: 0.81 g/cc at 15 deg C
Appearance/odour: White or pale yellow liquid, petroleum odour

4. HEALTH HAZARD INFORMATION

NATURE OF HAZARD

INHALATION:

Negligible hazard at normal temperatures (up to 38 deg C).
High vapour concentrations are irritating to the eyes, nose, throat and lungs; may cause headaches and dizziness; may be anesthetic and may cause other central nervous system effects.
Avoid breathing vapours or mists.

EYE CONTACT:

Slightly irritating, but will not injure eye tissue.

SKIN CONTACT:

Irritating.
Frequent or prolonged contact may irritate the skin and cause a skin rash (dermatitis).
Low toxicity.

INGESTION:

Low toxicity.
Small amounts of this liquid drawn into the lungs from swallowing or vomiting may cause severe health effects (e.g. bronchopneumonia or pulmonary edema).

CHRONIC:

Lifetime skin painting tests indicate that materials of similar composition

have produced skin cancer in experimental animals. The relationship of these results to humans has not been fully established.
May contain ethylene glycol monomethyl ether (EGME). Prolonged and/or repeated exposure through inhalation or extensive skin contact with EGME may result in toxic effects on the blood, the blood producing system, the kidneys, the male reproductive system and the embryo/fetus.

ACUTE TOXICITY DATA:

Based on animal testing data from similar materials and products, the acute toxicity of this product is expected to be:

Oral	:	LD50 > 5000 mg/kg	(Rat)
Dermal	:	LD50 > 2000 mg/kg	(Rabbit)
Inhalation	:	LC50 > 2500 mg/m3	(Rat)

OCCUPATIONAL EXPOSURE LIMIT:

Manufacturer recommends:
100 ppm based on composition.

Local regulated limits may vary.

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5. FIRST AID MEASURES

INHALATION:

In emergency situations use proper respiratory protection to immediately remove the affected victim from exposure. Administer artificial respiration if breathing has stopped. Keep at rest. Call for prompt medical attention.

EYE CONTACT:

Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT:

Immediately flush with large amounts of water. Use soap if available. Remove contaminated clothing, including shoes, after flushing has begun. If irritation persists, seek medical attention.

INGESTION:

DO NOT induce vomiting since it is important that no amount of the material should enter the lungs (aspiration). Keep at rest. Get prompt medical attention.

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6. PREVENTIVE AND CORRECTIVE MEASURES

PERSONAL PROTECTION:

The selection of personal protective equipment varies, depending upon

conditions of use.
In open systems where contact is likely, wear safety goggles, chemical-resistant overalls, and chemically impervious gloves.
Where only incidental contact is likely, wear safety goggles, long sleeves, and chemical-resistant gloves.
Where concentrations in air may exceed the occupational exposure limits given in Section 4 and where engineering, work practices or other means of exposure reduction are not adequate, approved respirators may be necessary to prevent overexposure by inhalation.

ENGINEERING CONTROLS:

The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a fumehood. Provide mechanical ventilation of confined spaces.
Use explosion-proof ventilation equipment.

HANDLING, STORAGE AND SHIPPING:

Keep containers closed. Handle and open containers with care.
Store in a cool, well ventilated place away from incompatible materials.
In keeping with good personal hygiene practices, wash hands thoroughly after handling the material.
Store and load at normal (up to 38 deg C) temperature and at atmospheric pressure.
Material will accumulate static charges which may cause a spark. Static charge build-up could become an ignition source. Use proper relaxation and grounding procedures.
Empty containers may contain product residue. Do not pressurize cut, heat, or weld empty containers. Do not reuse empty containers without commercial cleaning or reconditioning.

LAND SPILL:

Eliminate source of ignition. Keep public away. Prevent additional discharge of material, if possible to do so without hazard.
Prevent spills from entering sewers, watercourses or low areas. Contain spilled liquid with sand or earth. Do not use combustible materials such as sawdust.
Recover by pumping (use an explosion proof motor or hand pump), or by using a suitable absorbent.
Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately.
Take all additional action necessary to prevent and remedy the adverse effects of the spill.

WATER SPILL:

Remove from surface by skimming or with suitable absorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in unconfined waters.

Consult an expert on disposal of recovered material. Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately.
Take all additional action necessary to prevent and remedy the adverse

effects of the spill.

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7. FIRE AND EXPLOSION HAZARD

Flashpoint and method: 38 deg C TCC ASTM D56

Autoignition: NA Flammable Limits: LEL: NA UEL: NA

GENERAL HAZARDS:

Combustible Liquid; may form combustible mixtures at or above the flash point.
Decomposes; flammable/toxic gases will form at elevated temperatures (thermal decomposition).
Toxic gases will form upon combustion.
Static Discharge; material may accumulate static charges which may cause a fire.

FIRE FIGHTING:

Use water spray to cool fire exposed surfaces and to protect personnel.
Shut off fuel to fire if possible to do so without hazard. If a leak or spill has not ignited use water spray to disperse the vapours.
Use foam or dry chemical to extinguish fire.
Respiratory and eye protection required for fire fighting personnel.
Avoid spraying water directly into storage containers due to danger of boilover.
A self-contained breathing apparatus (SCBA) should be used for all indoor fires and any significant outdoor fires. For small outdoor fires, which may easily be extinguished with a portable fire extinguisher, use of an SCBA may not be required.

HAZARDOUS COMBUSTION PRODUCTS:

Smoke, carbon monoxide, carbon dioxide,
oxides of sulphur.
In addition, small amounts of nitrogen oxides will be formed.

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8. REACTIVITY DATA

STABILITY:

This product is stable. Hazardous polymerization will not occur.

INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:

Strong oxidizing agents. Use product with caution around heat, sparks, pilo lights, static electricity and open flames.

HAZARDOUS DECOMPOSITION:

See: Hazardous Combustion Products

9. NOTES

All components of this product are listed on the U.S. TSCA inventory.

Three year WHMIS review.

REVISION SUMMARY:
Since 29 April 1998, this MSDS has been revised in Section(s):
1, 3, 7

10. PREPARATION

Date Prepared: April 27, 2001
Prepared by: Lubricants & Specialties
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