LEGAL IMPLICATIONS: ACCESSING SPACE RESOURCES

• NATIONAL
  – FEDERAL LAW
  – STATE LAW
  – REGULATIONS

• INTERNATIONAL
  – CUSTOMARY LAW
  – TREATY LAW
  – SPACE LAW

• WEIGHT OF LEGAL IMPLICATIONS
  – DEPENDS ON MANAGEMENT CONTROL SYSTEM CHosen
“PURE” MANAGEMENT CONTROL COMPONENTS: LARGE ENTERPRISES

PRIVATE

- TRANS-ALASKA PIPELINE
- SATCOM COMPANIES
- EAST INDIA CO.
- HUDSON BAY CO.
- TRANSCONTINENTAL RAILROADS
- MIRCORP
- ORIGINAL COMSAT CORP.
- INTERLUNE-INTERMARS, INC.
- SPACE DEVELOPMENT CORP.
- LUNA CORP., ETC.

PRIVATE+

GOV’T R&D

ORG (ORIGINAL
AIRCRAFT
INDUSTRY)

INTERLUNE*

INTERNATIONAL SPACE STATION

INTERNATIONAL

APOLLO

SKYLAB

EUROTUNNEL

INTERNATIONAL

ANTARCTIC

REGIME

INTERLUNE*

INMARSAT*

INTELSAT*

LAW OF THE

SEA REGIME

MOON AGM’T

BLUE = SPACE ENTERPRISE

GREEN = COMPARABLE
MODERN
FINANCIAL
CHALLENGE

ITALICS = PROPOSED OR NOT
YET STABLE SPACE
ENTERPRISES

* = PROPORTIONATE USE VOTE

"SANTA MARIA" INC.

INTERSTATE HIGHWAYS

NATIONAL
## MANAGEMENT CONTROL APPROACHES

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<tr>
<td>ALL PRIVATE</td>
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MANAGEMENT CONTROL SYSTEM:
RELATIVE PRIORITIES - 1

• ALL GOVERNMENT OR GOVERNMENT / PRIVATE PARTNERSHIP
  – U.S. POLITICAL ENVIRONMENT
  – SPACE LAW ENVIRONMENT
  – MANAGERIAL CONTROL ENVIRONMENT
  – FINANCIAL AND TECHNICAL FEASIBILITY
    • BUDGETARY COMMITMENT
    • TECHNICAL MATURITY
  – REGULATORY ENVIRONMENT
MANAGEMENT CONTROL SYSTEM: RELATIVE PRIORITIES - 2

• INTERNATIONAL
  – SPACE LAW ENVIRONMENT
    • MANAGERIAL CONTROL ENVIRONMENT
      – CONTRACT DISPERSION
    – U.S. POLITICAL ENVIRONMENT
      • BUDGETARY COMMITMENT
      – TECHNICAL FEASIBILITY
        – FINANCIAL FEASIBILITY
MANAGEMENT CONTROL SYSTEM: RELATIVE PRIORITIES - 3

• **MULTILATERAL (INTELSAT)**
  – **PROPORTIONATE USE VOTING SYSTEM**
    • SPACE LAW ENVIRONMENT
    • MANAGERIAL FREEDOM
  – **FINANCIAL AND TECHNICAL FEASIBILITY**
    • RETURN ON INVESTMENT ?
    • TECHNICAL MATURITY
  – **U.S. POLITICAL ENVIRONMENT**
    • BUDGETARY COMMITMENT
MANAGEMENT CONTROL SYSTEM: RELATIVE PRIORITIES - 4

• ALL PRIVATE
  – FINANCIAL AND TECHNICAL FEASIBILITY
    • RETURN ON INVESTMENT
    • TECHNICAL MATURITY
  – MANAGERIAL FREEDOM
  – U.S. POLITICAL ENVIRONMENT
  – REGULATORY ENVIRONMENT
  – SPACE LAW ENVIRONMENT
RELATIVE PRIORITIES COMPARISON

• ALL GOVERNMENT OR GOVERNMENT / PRIVATE PARTNERSHIP
  – U.S. POLITICAL ENVIRONMENT
  – SPACE LAW ENVIRONMENT
  – MANAGERIAL CONTROL
  – FINANCIAL AND TECHNICAL FEASIBILITY
    • BUDGETARY COMMITMENT
    • TECHNICAL FEASIBILITY
  – REGULATORY ENVIRONMENT

• INTERNATIONAL
  – SPACE LAW ENVIRONMENT
    • MANAGERIAL CONTROL
      – CONTRACT DISPERSION
    – U.S. POLITICAL ENVIRONMENT
      • BUDGETARY COMMITMENT
      – TECHNICAL FEASIBILITY
      – FINANCIAL FEASIBILITY

• MULTILATERAL (INTELSAT)
  – PROPORTIONATE USE VOTING SYSTEM
    • SPACE LAW ENVIRONMENT
    • MANAGERIAL CONTROL
    – FINANCIAL AND TECHNICAL FEASIBILITY
      • RETURN ON INVESTMENT ?
      • TECHNICAL FEASIBILITY
  – U.S. POLITICAL ENVIRONMENT
    • BUDGETARY COMMITMENT

• ALL PRIVATE
  – FINANCIAL AND TECHNICAL FEASIBILITY
    • RETURN ON INVESTMENT
  – MANAGERIAL FREEDOM
  – U.S. POLITICAL ENVIRONMENT
  – REGULATORY ENVIRONMENT
  – SPACE LAW ENVIRONMENT
SEMI-QUANTITATIVE EVALUATION OF MANAGEMENT APPROACHES: FINANCING ISSUES

- MINIMUM TOTAL START-UP CAPITAL REQUIRED
  - FIRST HE-3 DELIVERY TO FIRST ON-LINE FUSION POWER PLANT
- MINIMUM TAX REVENUES REQUIRED
- MINIMUM PRIVATE CAPITAL REQUIRED
- #MINIMUM COST OF CAPITAL / INTEREST ON NATIONAL DEBT
- *MAXIMUM FINANCING FEASIBILITY
- LEAST REGULATORY COSTS
- *MINIMUM OPERATING COSTS
- *MAXIMUM RETURN ON INVESTMENT
  - FOR GOVERNMENT: SPINOFFS, LOWER POWER COSTS, REDUCED IMPORTS, ENVIRONMENTAL BENEFITS
- *MAXIMUM STAYING POWER

# WEIGHTING FACTOR OF 2
* WEIGHTING FACTOR OF 3

SCHMITT, 1998, SPACE 98, ASCE
SEMI-QUANTITATIVE EVALUATION OF MANAGEMENT APPROACHES: MANAGERIAL ISSUES

- MINIMUM COMPLEXITY OF MANAGEMENT
- #MINIMUM COMPLEXITY OF OPERATIONS
- ACCESS TO LARGEST TECHNICAL BASE
- #QUALITY IN PLANNING
- #QUALITY IN RDT&E
- #QUALITY IN PRODUCTION
- #QUALITY IN OPERATIONS
- QUALITY IN MARKETING AND SALES
- QUALITY IN PRODUCT DISTRIBUTION
- *MAXIMUM SALES MARGINS
- #QUALITY IN FINANCIAL CONTROLS
- #QUALITY OF WORK FORCE
- *MOTIVATION OF WORK FORCE

# WEIGHTING FACTOR OF 2
* WEIGHTING FACTOR OF 3

SCHMITT, 1998, SPACE 98, ASCE
SEMI-QUANTITATIVE EVALUATION OF MANAGEMENT APPROACHES: EXTERNAL ISSUES

- *MAXIMUM ENVIRONMENTAL PROTECTION
- MAXIMUM POTENTIAL FOR TECHNOLOGY SPIN-OFF
- #MAXIMUM BENEFIT TO OVERALL U.S. ECONOMY
- *MAXIMUM BENEFIT TO PEOPLE IN DEVELOPING NATIONS
- #MAXIMUM POTENTIAL FOR SPACE SETTLEMENT

# WEIGHTING FACTOR OF 2
* WEIGHTING FACTOR OF 3

SCHMITT, 1998, SPACE 98, ASCE
SEMI-QUANTITATIVE EVALUATION OF MANAGEMENT APPROACHES

FIN. | MGT. | EXT. | AGGREGATE

SCHMITT, 1998, SPACE 98, ASCE
INTERNATIONAL LAW: GENERAL - 1

- WHAT COUNTS AS INTERNATIONAL LAW?
  - LAW OF PRESENT INTERNATIONAL POLITICAL SYSTEM "GOVERNING" THE COEXISTENCE OF NATIONS
    - BODY OF PRINCIPLES
    - RULES
    - INSTITUTIONS
    - PROCEDURES AND PRECEDENTS
    - BENEFITS
- WHAT ARE ITS POTENTIAL ADVANTAGES?
  - REGULATION OF RELATIONS
  - PREDICTABILITY OF INTERACTIONS
  - RESOLUTION OF DISPUTES
INTERNATIONAL LAW: GENERAL - 2

• DOES INTERNATIONAL LAW WORK?
  – MOST STATES COMPLY WITH MOST OF THE TIME.

• SOURCES
  – TREATIES OR FORMAL AGREEMENTS
  – INTERNATIONAL CUSTOMARY LAW
  – GENERAL PRINCIPLES OF LAW RECOGNIZED BY MOST MAJOR NATIONAL LEGAL SYSTEMS

• TREATIES AND AGREEMENTS
  – MOST IMPORTANT COMPONENT OF INTERNATIONAL LAW
  – LEGALLY BINDING ONLY ON THOSE WHO RATIFY
  • INTERNATIONAL PRESSURES CAN BE APPLIED
  – MAY REQUIRE MINIMUM NUMBER TO "ENTER INTO FORCE"
  – "RESERVATIONS" RELATED TO PARTICULAR PROVISIONS MAY BE TAKEN BY INDIVIDUAL STATES
INTERNATIONAL LAW: GENERAL - 3

- CUSTOMARY LAW
  - WIDESPREAD PRACTICE OR COMMON TO MOST LEGAL SYSTEMS
  - "RULE" FOLLOWED AS BINDING OVER TIME RATHER THAN CONVENIENT
TERRESTRIAL MINING LAW: GENERAL -1

• NATIONAL SYSTEMS PREDOMINATE

• ALL "INTERNATIONAL" MINING LAW DERIVES FROM NATIONAL LAW.

• ALTERNATIVE SITUATIONS FOR A PROSPECTIVE MINER:
  - OWNS LAND AND MINERAL RIGHTS
  - OWNS ONLY THE MINERAL RIGHTS
  - LEASES MINERAL RIGHTS FROM OWNER
  - EMPLOYED BY “STATE” OWNER

• PUBLIC OWNERSHIP OF MINERAL BEARING LANDS
  - ROOTS IN "SOVEREIGN" RIGHTS, I.E., THE RIGHTS OF THE CROWN.
TERRESTRIAL MINING LAW: GENERAL -2

• ACCESS TO PUBLIC MINERAL RIGHTS:
  – MINING CLAIMS SYSTEM (MINER HAS TITLE TO EXTRACTED MINERALS)
  • CURRENT SPACE LAW
  – CONCESSION OR LEASING SYSTEM (STATE HAS TITLE TO MINERALS)
  – STATE PRODUCTION
  – STATE-PRIVATE PARTNERSHIPS
  – STATE MANAGED CONTRACTS WITH PRIVATE ENTITIES

• REGULATORY CONTROL MAY BE (AND USUALLY IS) EXERTED BY THE STATE
  – LAUNCH LICENSES
  – COMMUNICATION LICENSES
  – RETURN PAYLOAD LICENSES
  – ENVIRONMENTAL IMPACT STATEMENT
TERRESTRIAL MINING LAW: HISTORY - 1

- UNITED STATES*
  - PRIVATE ENTERPRISE UNDER REGULATORY FRAMEWORK
- GENERAL MINING LAW OF 1872 LARGELY MODIFIED BY MODERN ENVIRONMENTAL REGULATIONS
  - CLAIMS SYSTEM (METALLIC AND NON-METALLIC MINERALS)
  - BIDDING / LEASING SYSTEM (FOSSIL FUELS)
- NO EFFECTIVE NATIONAL MINERALS POLICY EXCEPT DURING WAR-TIME (WW II AND KOREA)
- STRATEGIC MATERIALS "POLICY" DRIVEN BY THE INTERNATIONAL MARKETPLACE AND DOMESTIC POLITICS
- STRATEGIC STOCKPILE NO LONGER A PRIORITY ISSUE
  - (EVEN THOUGH, AS A MARITIME NATION, IT PROBABLY SHOULD BE)

*SEE <http://www.cnie.org/nle/mine-1.html> FOR DETAILS
TERRESTRIAL MINING LAW: HISTORY - 2

- SOVIET UNION / RUSSIA
  - ORIGINAL OBJECTIVES OF STATE PRODUCTION
    - SELF-SUFFICIENCY
    - ECONOMIC BASE FOR SETTLEMENT OF SIBERIA
    - FOREIGN EXCHANGE
  - CURRENT OBJECTIVES OF STATE-PRIVATE PARTNERSHIPS
    - FOREIGN EXCHANGE
    - CRIMINAL AND / OR POLITICAL CONTROL
    - RE-EMERGENCE OF NATIONALISM
TERRESTRIAL MINING LAW: HISTORY - 3

- **CHINA**
  - STATE PRODUCTION THROUGH MILITARY SUBDIVISIONS
    - WARLORD TRADITION
  - STATE EMPHASIS ON INDUSTRIAL AND ENERGY SUPPLY GROWTH
  - SOME TRANSITION TO CONCESSION SYSTEM?

- **JAPAN**
  - "PRIVATE" ENTERPRISE WITH CLOSE STATE COOPERATION / INFLUENCE
  - DEPENDENT ON IMPORTS FROM FOREIGN PRODUCERS OR FROM CONCESSIONS IN FOREIGN LANDS
TERRESTRIAL MINING LAW: HISTORY - 4

- WESTERN EUROPE
  - SPECTRUM OF APPROACHES
    - UNITED KINGDOM: MIX BETWEEN U.S. AND JAPAN
    - FRANCE: SIMILAR TO JAPAN
    - NORWAY: PRIVATE INTERNALLY / CONCESSIONS IN THE OFF-SHORE
    - SWEDEN: STATE-PRIVATE PARTNERSHIPS

- THIRD / FOURTH WORLD NATIONS
  - LARGELY CONCESSIONS TO PRIVATE OR FOREIGN STATE-RUN ENTITIES
TERRESTRIAL MINING LAW: IMPLICATIONS IN AN INTERNATIONAL REGIME

• A FUTURE NEGOTIATED SYSTEM MAY NOT HAVE A ROLE FOR PRIVATE ENTERPRISE
  – ALL RESOURCE ACTIVITY MAY BE UNDERTAKEN BY THE INTERNATIONAL ENTITY

• IF PRIVATE ENTERPRISE HAS A ROLE, IT MAY BE WITH A:
  – COMPETITIVELY BID CONCESSION, WITH PAYMENT OF RENT AND/OR ROYALTIES,
  – NON-COMPETITIVE CONCESSION, OR
  – CONTRACT TO WORK FOR THE INTERNATIONAL ENTITY.
CHRONOLOGY OF INTERNATIONAL AGREEMENTS RELEVANT TO SPACE

**EARTH**
- Antarctic Treaty 1959
- Antarctic Mineral Resources Convention 1988
- Antarctic Environment Protocol 1991
- Rio Environmental Agreements 1992
- Kyoto Agreement 1997
- Senate Ratification “Law of the Sea” 2004

**SPACE**
- Intelsat Agreement 1964
- Outer Space Treaty 1967
- Rescue/Return of Astronauts, etc. 1968
- Liability for Damage in Space 1972
- Registration of Objects Launched 1975
- Immarsat Agreement 1976
- Moon Agreement 1979
- Space Station Agreement 1988
- Commercial Space Act of 1997
- Commercial Space Act of 1998
- Commercial Space Act of 2003

*ITALICS* - NOT RADIFIED BY U.S.

*RED* - ONLY SPACE TREATY DIRECTLY RELEVANT TO RESOURCES