

Regimes of Denial
and our
Required Responses to Them

A presentation Ψ
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Ψ Revised version of a presentation on:
"Imperatives of Foreign Export Controls
on Indian Manufacturing Industry"
made on 15 December 1995
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- Technology : **Make or Buy**
- The purpose of my presentation is to delineate current and on-coming regimes of foreign technology denial which :
 - already preclude the option of '**buy,**'
 - and will do so increasingly in the future.

THEREFORE:

- If Indian industry is genuinely seeking to be truly globally competitive, it will, perforce, have to '**make**'.
- Outline how this can be done.

Epochs of denial

WW I to WW II

- Fear of entanglement in other's wars, and fear of domestic (US) food and material shortages dominate export controls (e.g.s. Trading With the Enemy Act, 1917 ; Neutrality Act, 1935).

WW II to end of Cold War

- From end of WW II to end of Cold War, fear of communist 'expansion' caused Western allies & Japan to practice (variably) moderate to severe 'dual-use' technology denial on FSU and Warsaw Pact countries. COCOM formed in 1949 as secret organisation.

End-of-Cold War to Now

- End of Cold War has rotated axis of West-East technology-denial regimes 90 degrees towards South. All-White North fears economic and military rise of Brown-Black South. (Full-scope safeguards for nuclear ; MTCR for Missiles/Space ; 'dual-use' for other.)

Fear is the key

Indian breakthroughs have 'leveraged' denial regimes

NUCLEAR

May 1974	Pokharan	Sept '74: Select NPT-Members Committee promulgates Zangger 'Trigger' List.
1975+	Heavy-water Plants con- struction begun with imported equipment from France & West Germany	'London Club' formed to control nuclear- related exports. Later, 'London Club' expands into Nuclear Suppliers Group (NSG) to include France and East Bloc countries.

1977	Power Reactor Plutonium Recovery Plant (PREFRE) at Tarapur commissioned	1978 : Nuclear Technology export conditionalities made more stringent. IAEA safe-guards requirement added.
Late 70's	Heavy-water Plants start to come on stream	1978: NSG adds heavy-water production items to Zangger Trigger list.
Through 1980's	Fuel reprocessing plant expanded at Tarapur; new one at Kalpakkam.	1990 : Uranium reprocessing equipment added to expanded Zangger Trigger List.
	Fast Breeder Test Reactor commissioned.	Japan and Germany require full-scope safeguards on nuclear exports.

Early
1990's

Indian
Uranium
enrichment
capability
reliably
reported.

@
1992 :
Nuclear-related 'dual-
use' transfers restric-
ted by NSG.

@
1993:
NSG requires full-
scope safeguards on
all nuclear transfers.

@
These were 'leveraged'
also by Iraq's
(i.e. non-White country)
activities just prior.

SPACE/MISSILES

Mid-to Late '70s	'Space' profile evolved. Indo-Soviet, Indo-French and Indo-German collaborative arrangements	Missile and 'space' item transfers placed on agenda of East-West conventional arms limitation talks of 1970's.
Late 1980's	Indian Guided Missile Programme becomes public knowledge	1987: Missile Technology Control Regime (MTCR) promulgated
August 1990	Kalam lecture (public) reveals Space-DRDO links and academia-industry networking	Nov. 1991: MTCR revised
May 1992	Second 'AGNI' launch	Jan. '93: Tightening of MTCR

SUPER-COMPUTERS

Reverse impact of a denial regime

Dec. 1986	First parallel computing project for CFD at NAL, Bangalore confirms feasibility (FLOSOLVER Mk 1)	Cray Research Inc. (US) negotiates for India Met.D. CFD requirement
1988	'Cray' XMP 14 procured from US for India Met.D.	Conditionalities on "non-nuclear" use imposed. <i>In situ</i> surveillance by USG officials of observance of conditionalities.
1989+	BARC, C-DAC, C-DOT, DRDO, NAL begin efforts at development of parallel processing 'super-computers'	1990: Los Alamos (Worlton) report concludes that "super-computers" are not necessary to design nuclear weapons.

'91 -

'92

C-DAC exports
PARA-Ilel M-achines
to Canada, Germany
and Russia;

while others e.g.,
DRDO's PACE
and NAL's
FLOSOLVER Mk III

match capability of
US-made
mid-range
work-stations.

Nov.
1994

PARAM displayed
at '*Super-computing*
'94' exposition in
Washington. C-DAC:
"MTOPs of 10,000
within reach by
end-'95"

Dec. 1992 :

US Office of
Naval Research
sends official
to Bangalore
conference to
assess Indian
capabilities in
"super-computing"

1993 :

US authorises
licensed condi-
tional export of
work-stations to
several Indian
institutions.

March '95 :

Cray Inc. files for
bankruptcy.

April
1995

India places parallel processing super-computers on *its* list of items requiring an (Indian) export licence.

July '95 :
US begins review of its 'Super-computer' export controls

October '95:
US relaxes markedly controls on computer exports to India.

Conclusion :

"Strength respects strength"

— Kalam

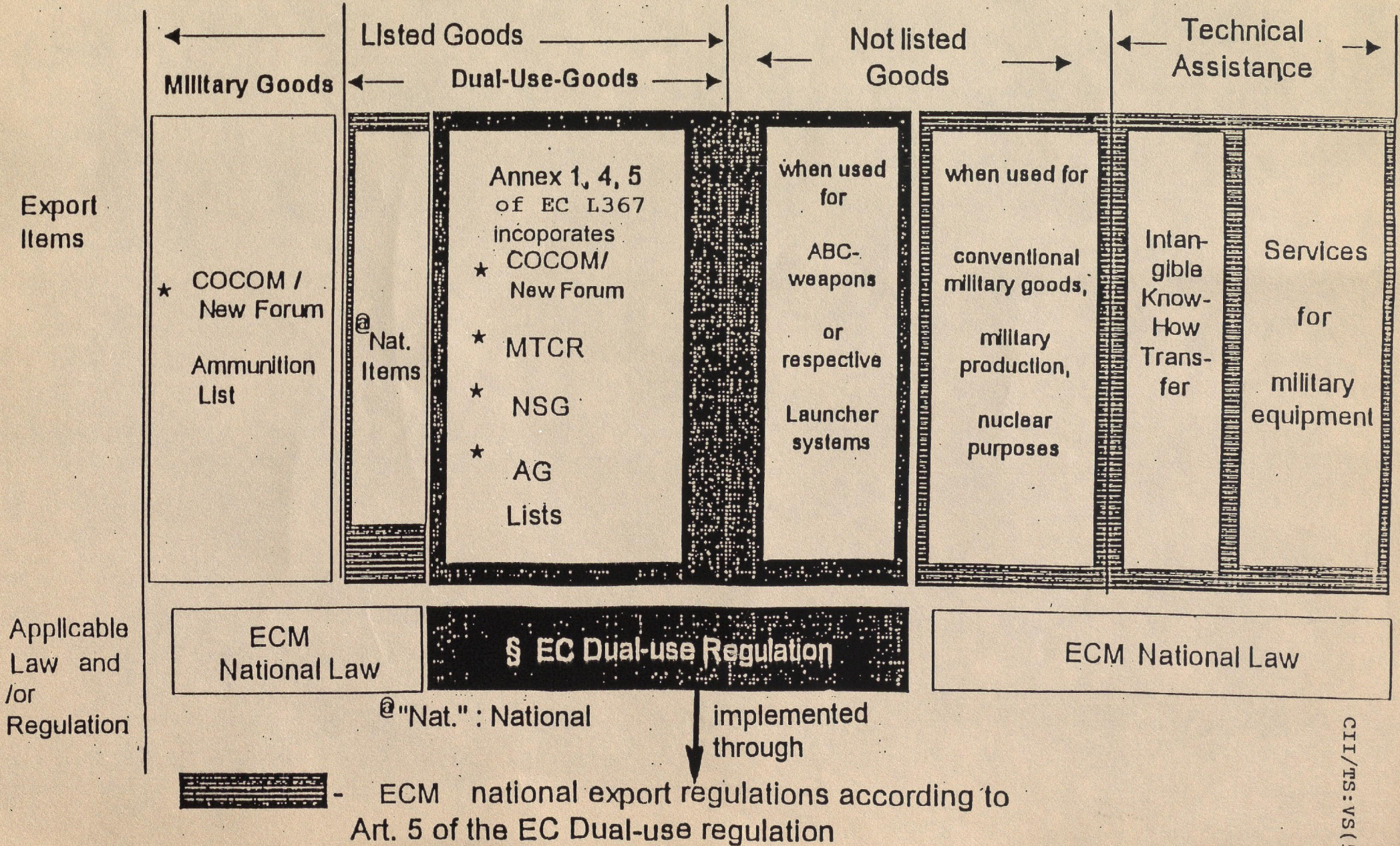
Membership* of technology cartels and denial regimes is almost wholly White

* as of 31 Aug. '95

Nuclear Suppliers Group (1978)	29 + South Africa + Japan
Australia Group (Mid-1985)	28 + Japan
MTCR (1987)	26 + Japan
Moscow Summit (Jan. 1994)	Clinton-Yeltsin joint "Memorandum of Intent" on "Cooperation in the Area of Export Control"

EXPORT CONTROL REGIMES

OVERVIEW OF TYPICAL APPLICABLE LAW AND REGULATIONS IN EUROPEAN COMMUNITY MEMBER (ECM) COUNTRIES



Example of EC 'catch-all' Provision

End-Use Control

thru' application of

U.K. Dual-Use & Related Goods (Export Control) Regulations, 1995

Makes licensable *any* goods if

- the exporter is informed by the authorities
- or knows
- or suspects (after having made reasonable enquiries)

that the goods are or may be intended in their entirety or in part for use in connection with weapons of mass destruction or the missiles to deliver them.

**IMTMA Members have direct
experience of foreign 'dual-use'
export controls (*Circa 1992*)**

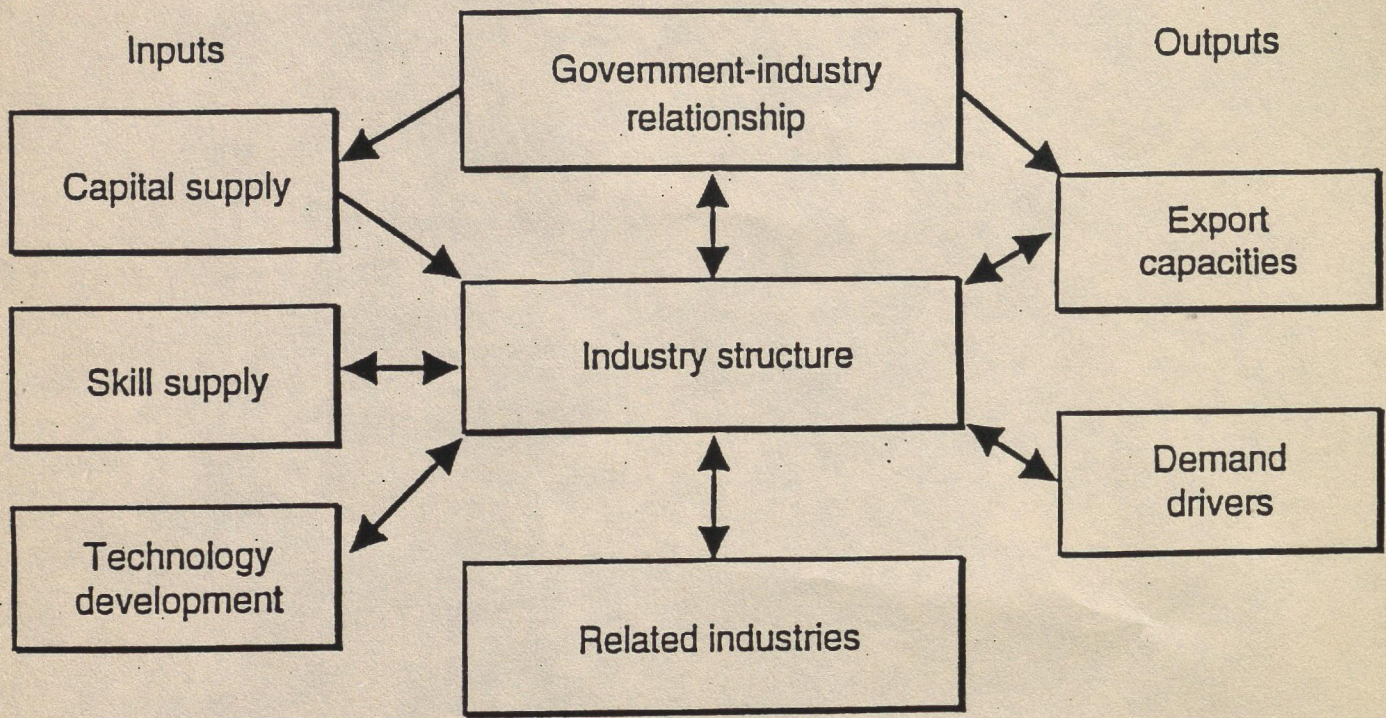
For even such items as :

- AC Servomotors
- Precision pre-loaded ball screws
- Limit switches

IMTMA members certified that items

- Will not be used by armed forces ***or police***
- Will not be used for ***development or manufacture of*** :
 - Weapons, ammunition or armaments
 - Material, equipment or installation for nuclear purposes
 - Missiles
 - Aircraft in-flight re-fueling equipment.

Machine Tools



Determinants of Comparative Advantage in Machine Tools

- What is importable is only purchasable technology
- Purchasable technology is out-of-date. Typically, Japan licenses-out technology which is at least one generation behind.
- Contemporary technology is not purchasable.

So, have to 'make'. How ?

- Close government - industry partnership for development of manufacturing technology, through / by :
- Government funding (in small or large part) of development
 - **by** industry (mostly)
 - **in** industry (mostly)

of **saleable prototypes** of capital goods for manufacturing

- PATSER/TIFAC-HGT models and money
- R&D Cess Money
- Restructure relevant R&D institutions (e.g. CMTI)
- **Restructure blue / grey-collar training**