International Instruments for Nuclear Safety and the Fukushima Accident

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CSIS Meeting on Nuclear Safety

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"A nuclear accident
anywhere
is a nuclear accident
everywhere."

Hans Blix, Former IAEA DG

BACKGROUND

- *MARCH 11—EARTHQUAKE AND TSUNAMI STRIKE 6 REACTORS AT FUKUSHIMA DAIICHI*
- *MARCH 21—SPECIAL IAEA BOARD MEETING ON FUKUSHIMA*
- *MARCH 28—IAEA DIRECTOR GENERAL AMANO ANNOUNCES MINISTERIAL SAFETY CONFERENCE JUNE 20-24 IN VIENNA*
- *MARCH 31—FRENCH PRESIDENT SARKOZY CALLS FOR IMPROVED SAFETY STANDARDS TO BE DISCUSSED AT MAY G-8 MEETING IN DEAUVILLE*
- *APRIL 4—5TH REVIEW MEETING OF THE CONVENTION ON NUCLEAR SAFETY OPENS IN VIENNA*

THE FUKUSHIMA EVENT RAISES THE QUESTION OF WHETHER THE INTERNATIONAL LEGAL FRAMEWORK FOR NUCLEAR SAFETY IS ADEQUATE OR REQUIRES REVISION

***MAJOR ISSUES INCLUDE*:**

-- DID THE CONVENTIONS HAVE ANY IMPACT ON THE OCCURRENCE OR SEVERITY OF THE FUKUSHIMA ACCIDENT?

-- SHOULD THE GENERAL SAFETY OBLIGATIONS IN THE RELEVANT INSTRUMENTS BE MADE MORE PRECISE AND MANDATORY—AND IF SO, HOW?

-- SHOULD BROADER AND MORE TIMELY INFORMATION DURING AN EVENT AND IN THE REVIEW PROCESS UNDER THE INSTRUMENTS BE MANDATED?

-- SHOULD INTERNATIONAL SAFETY REVIEWS AND/OR INSPECTIONS BE MANDATORY?

-- ARE NEW INTERNATIONAL INSTITUTIONAL ARRANGEMENTS OR INSTITUTIONS NEEDED?

THE INTERNATIONAL LEGAL FRAMEWORK

-- CONVENTION ON EARLY NOTIFICATION OF A NUCLEAR ACCIDENT (1986)
-- CONVENTION ON ASSISTANCE IN THE EVENT OF A NUCLEAR ACCIDENT (1986)
-- CONVENTION ON NUCLEAR SAFETY (1994)
-- CONVENTION ON THE SAFETY OF SPENT FUEL AND RADIOACTIVE WASTE MANAGEMENT (1997)
-- CODE OF CONDUCT ON THE SAFETY AND SECURITY OF RADIOACTIVE SOURCES
-- CONVENTIONS ON CIVIL LIABILITY FOR NUCLEAR DAMAGE (PARIS, BRUSSELS, VIENNA AND SUPPLEMENTARY COMPENSATION)
-- STATUTE OF THE IAEA (ART. III.A.6)
-- STATUTE OF THE OECD NUCLEAR ENERGY AGENCY (ART. 1.2 AND ART. 8.1.1 AND 8.1.6

A CONVENTION ADDRESSING BROAD ISSUES OF SAFETY COULD NOT BE NEGOTIATED IMMEDIATELY AFTER THE 1986 CHERNOBYL ACCIDENT BECAUSE OF USSR OBJECTIONS

INSTEAD, TWO CONVENTIONS—ON EARLY NOTIFICATION AND ASSISTANCE—WERE RAPIDLY NEGOTIATED AND ENTERED INTO FORCE FOR MOST PARTIES IN 1986 OR 1987

THE COMPANION CONVENTIONS PROVIDE A FRAMEWORK AND PROCEDURES FOR NOTIFICATION AND ASSISTANCE, BUT DO NOT IMPOSE SPECIFIC AND MANDATORY REQUIREMENTS ON STATES PARTIES

MAJOR TECHNICAL ADVANCES IN INFORMATION TECHNOLOGY IN THE PAST QUARTER CENTURY HAVE RENDERED THE NOTIFICATION PROCEDURES IN THE CONVENTION FORMALISTIC AND LARGELY UNNECESSARY

ALTHOUGH THE IAEA INCIDENT AND EMERGENCY CENTRE WAS ACTIVATED IMMEDIATELY UPON NEWS OF THE EVENT, IT IS UNCLEAR WHETHER THE CONVENTION PROCEDURES WERE FOLLOWED

Negotiation of the CNS

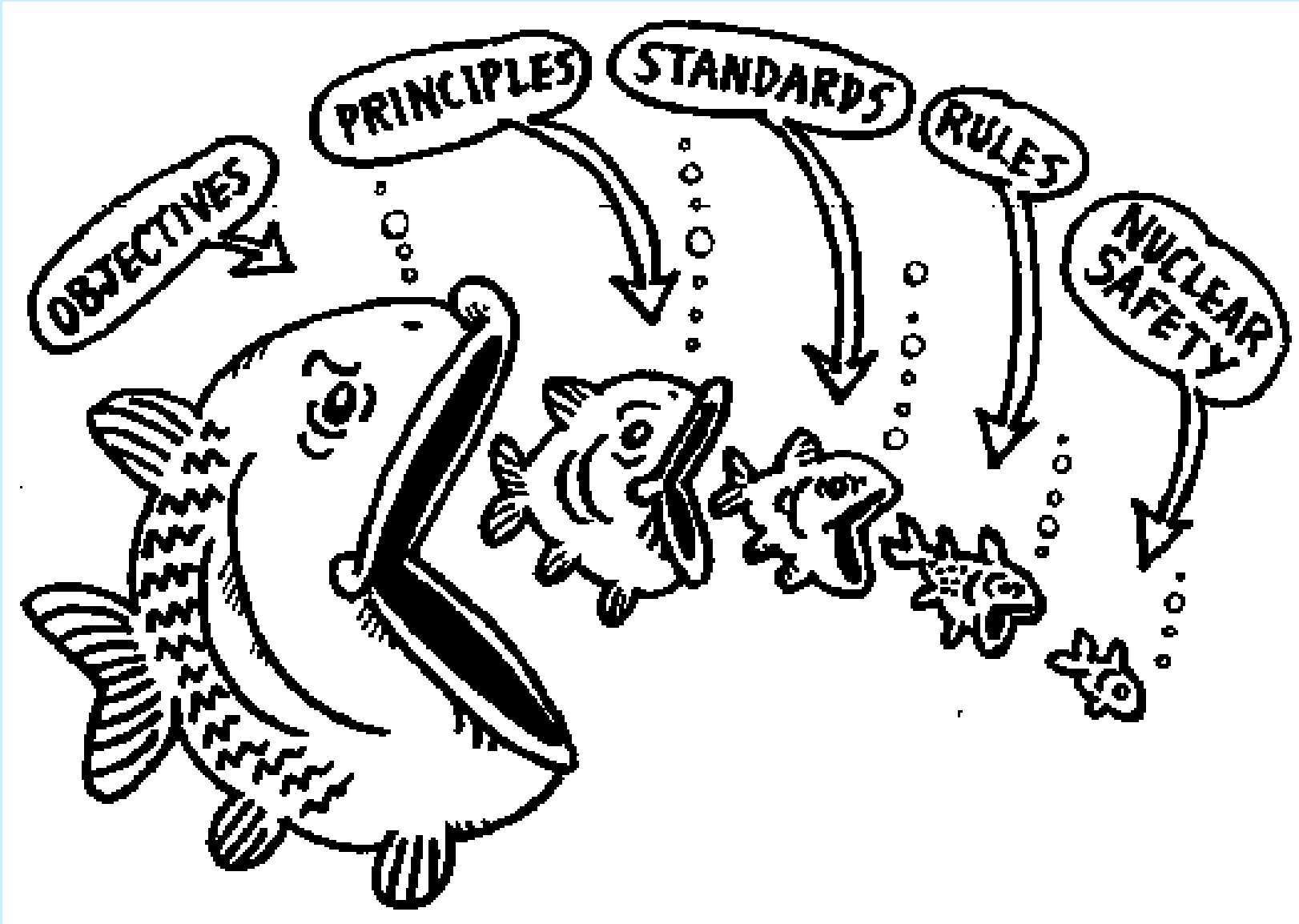
- *BEFORE CNS, NUCLEAR SAFETY CONSIDERED ALMOST COMPLETELY A SOVEREIGN NATIONAL CONCERN*
- *TRANS- BOUNDARY ASPECTS OF THE 1986 CHERNOBYL ACCIDENT RAISED MAJOR SAFETY CONCERNS*
- *1991 BREAK-UP OF FORMER USSR RAISED FURTHER CONCERNS ABOUT NUCLEAR POWER IN NIS*
- *SEPTEMBER 1991 VIENNA CONFERENCE ON NUCLEAR SAFETY CALLS FOR CONVENTION*
- *INFORMAL, OPEN-ENDED WG DEVELOPS TEXT BETWEEN 1991 AND 1994 AND JUNE 1994 DIPLOMATIC CONFERENCE ADOPTS CNS TEXT*
- *CNS ENTERS INTO FORCE OCTOBER 1996*
- *CURRENT MEMBERSHIP OF 72 PARTIES INCLUDES ALL NUCLEAR POWER STATES, EXCEPT IRAN*

Basic Character of the CNS

- ***NOT A REGULATORY REGIME; NO INSPECTIONS OR INTERNATIONAL SECRETARIAT***
- ***NOT A SANCTIONS REGIME WITH PENALTIES FOR NON-COMPLIANCE***
- ***CONSIDERED AN INCENTIVE CONVENTION WITH PERIODIC PEER REVIEW MEETINGS TO ENCOURAGE MEMBER STATES TO MEET CNS OBLIGATIONS***

Objectives of the CNS—Art. 1

- *TO ACHIEVE AND MAINTAIN A HIGH LEVEL OF NUCLEAR SAFETY WORLDWIDE*
- *TO ESTABLISH & MAINTAIN EFFECTIVE DEFENCES . . . AGAINST POTENTIAL RADIO-LOGICAL HAZARDS . . . TO PROTECT INDIVIDUALS SOCIETY AND THE ENVIRONMENT FROM HARMFUL EFFECTS OF IONIZING RADIATION*
- *TO PREVENT . . . AND MITIGATE RADIOLOGICAL CONSEQUENCES OF ACCIDENTS*


OBJECTIVES
PRINCIPLES
STANDARDS
RULES
NUCLEAR SAFETY
NOT

Basic Obligations of the CNS

- *TO PREPARE AND MAKE AVAILABLE A NATIONAL REPORT INCLUDING A SELF-ASSESSMENT OF STEPS AND MEASURES TAKEN TO IMPLEMENT THE CNS (ART. 5)*
- *TO SUBJECT THE NATIONAL REPORT TO PEER REVIEW BY OTHER PARTIES AT PERIODIC MEETINGS AND TO TAKE AN ACTIVE PART IN THAT REVIEW AND THE REVIEW OF REPORTS OF OTHER PARTIES (ART. 24.1)*
- *TO IMPLEMENT CNS UNDER NATIONAL LAW (ART. 4)*

Legislation and Regulation
Article 7

- *Establish and maintain legislative and regulatory framework*
- *Establish national safety requirements and regulations*
- *System of licensing*
- *System of regulatory inspection and assessment*
- *System of enforcement*

Regulatory Body
Article 8

- ***Establish regulatory body with "adequate authority, competence and financial and human resources"***
- ***"ensure an effective separation" between regulatory functions and those of any body concerned with promotion or utilization of nuclear energy***

Responsibility of the Licence Holder
Article 9

- ***Prime responsibility for the safety of a nuclear installation rests with the holder of the relevant licence***

General Safety Considerations

ART. 10—PRIORITY TO SAFETY
ART. 11—FINANCIAL AND HUMAN RESOURCES
ART. 12—HUMAN FACTORS
ART. 13—QUALITY ASSURANCE
ART. 14—ASSESSMENT AND VERIFICATION OF SAFETY
ART. 15—RADIATION PROTECTION
ART. 16—EMERGENCY PREPAREDNESS

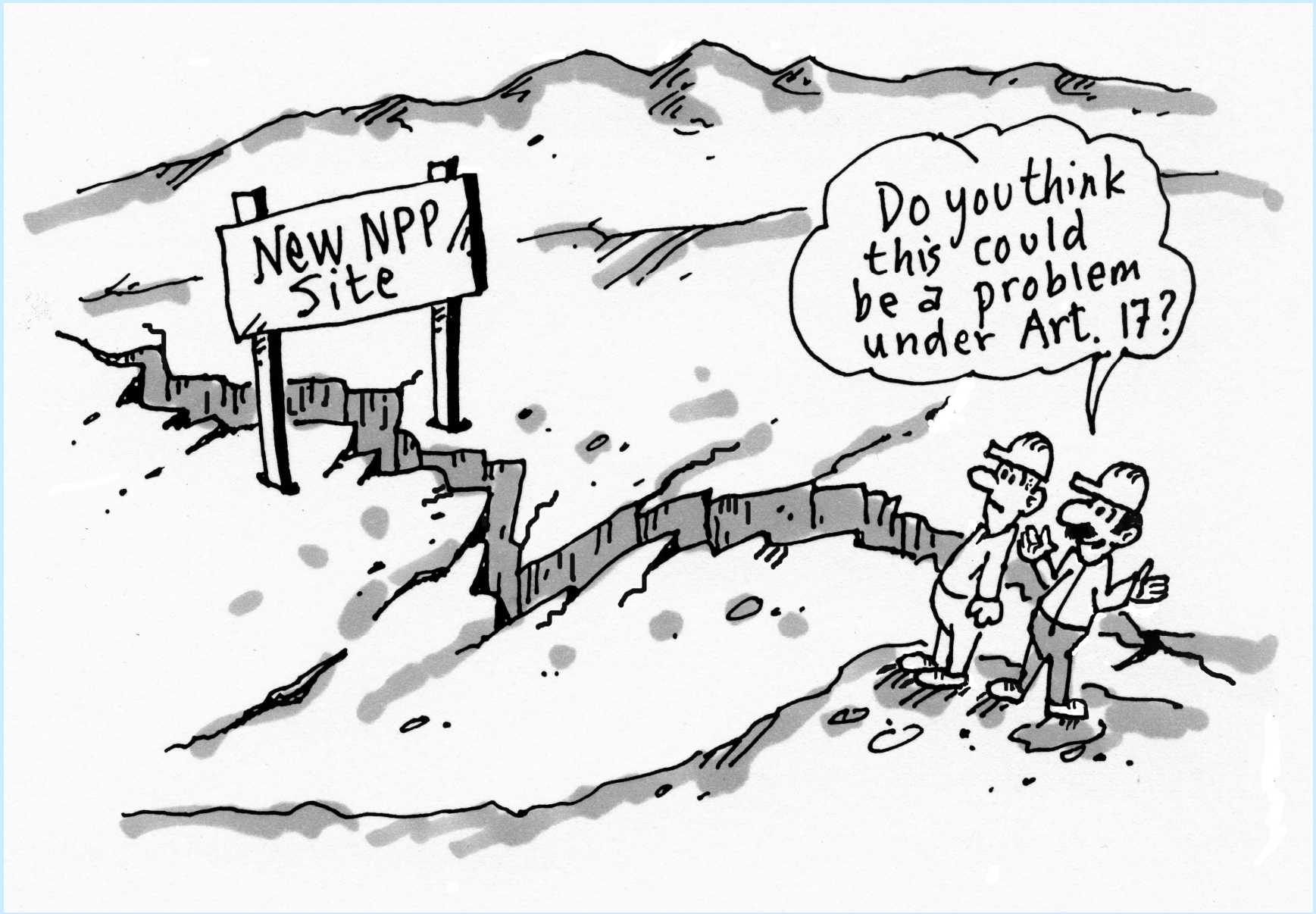
Safety of Installations
Article 17--Siting

(i) Evaluation of safety related site factors

(ii) Evaluation of installation's safety impact

(iii) Continued safety acceptability

(iv) Consultation with Contracting Parties in the vicinity of a proposed installation and provision of information

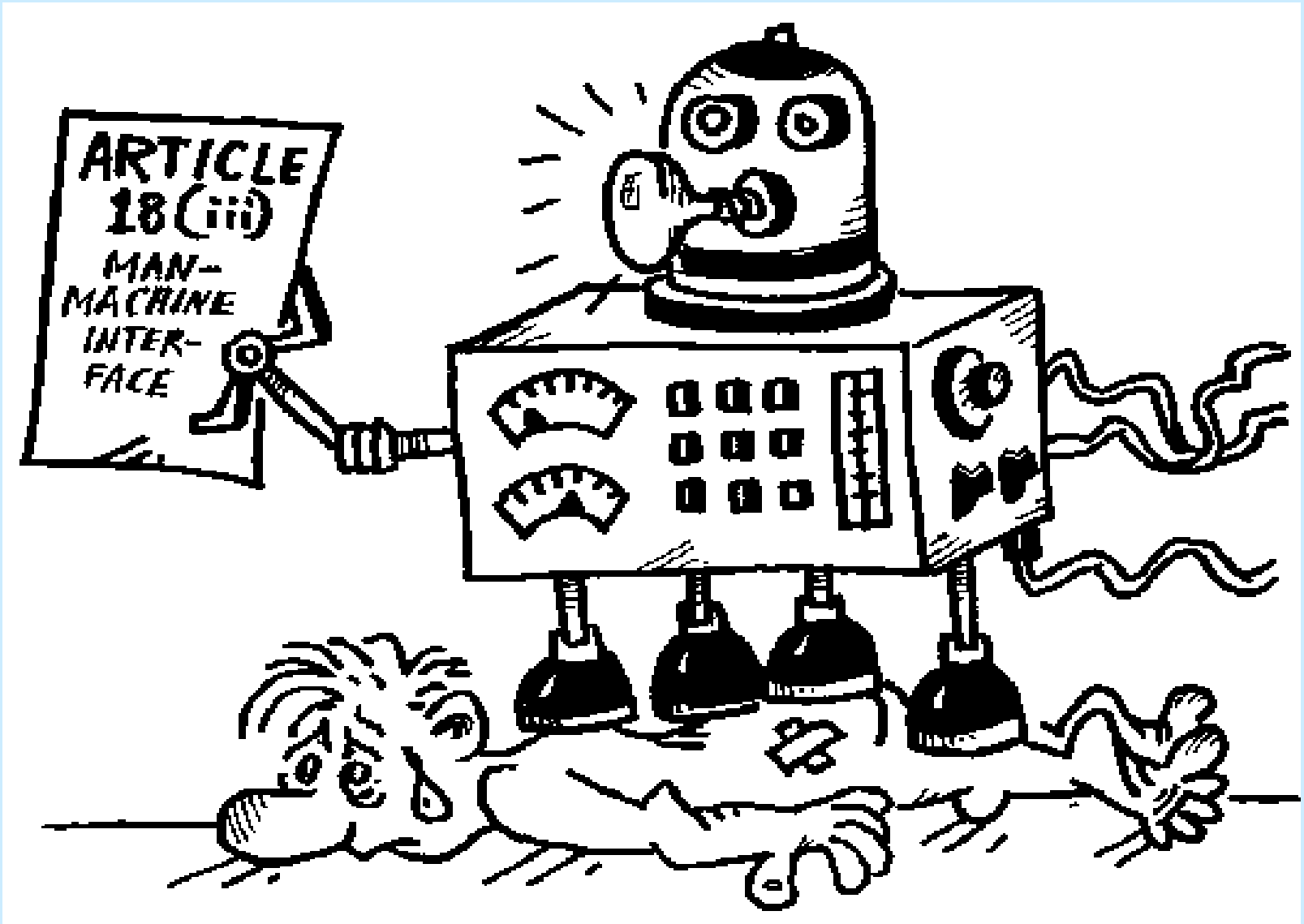

New NPP Site
Do you think this could be a problem under Art. 17?

Safety of Installations
Article 18—Design & Construction

(i) Defense in depth; prevention; mitigation

(ii) Technologies proven by experience or qualified by testing or analysis

(iii) Reliable, stable and easily manageable operation; human factors; man-machine interface


ARTICLE
18(ii)
MAN-
MACHINE
INTER-
FACE

Safety of Installations
Article 19--Operation

(i) Authorization based on safety analysis & commissioning program

(ii) Operational limits

(iii) Approved procedures for operation, maintenance, inspection and testing

(iv) Response procedures for accidents/occurrences

(v) Engineering and technical support available

(vi) Incident reporting

(vii) Collection and analysis of operating experience

(viii) Generation of waste kept to minimum

The CNS Review Process
Main Elements

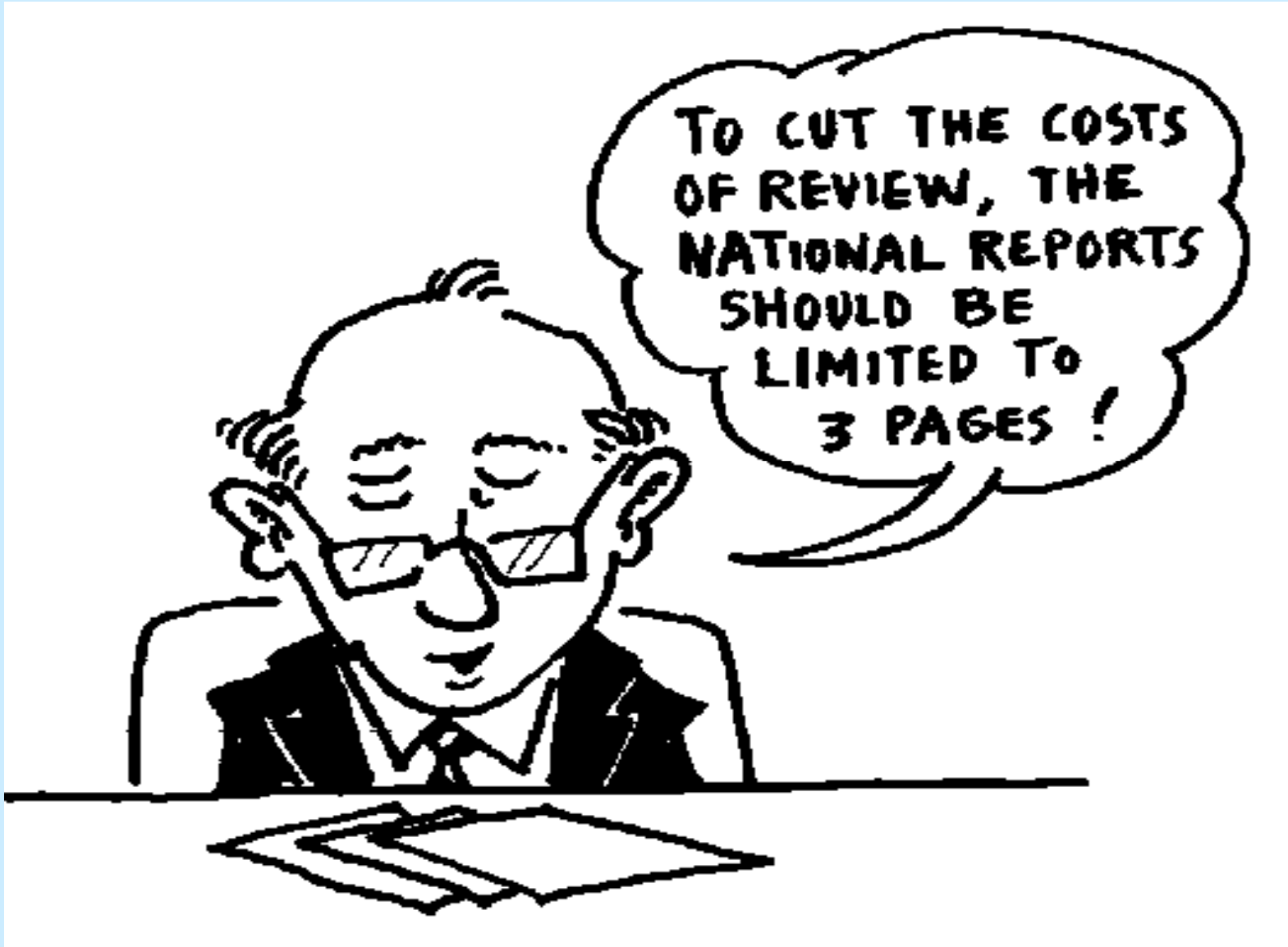
- *Each Party prepares a National Report*
- *Parties review other National Reports*
- *Questions and Comments through Group Coordinators before the Review Meeting*
- *Discussion of National Reports at Review Meeting with response to questions or comments*
- *Oral reports by Group Rapporteurs*
- *Consensus approval of final Summary Report*

CNS Review Meetings
Every Three Years

- *1ST Meeting: 12- 23 April 1999*
- *2nd Meeting: 15-26 April 2002*
- *3rd Meeting: 11-22 April 2005*
- *4th Meeting: 14-25 April 2008*
- *5th Meeting: 4-15 April 2011*

National Reports

- *Art. 5. provides no guidance on form, length or content of reports*
- *Details in Rules of Procedure and Financial Rules adopted at Preparatory Meeting (Article 22)*
- *Rule 40.2 confirms the right of Parties to submit reports "with the form, length and structure it believes necessary".*
- *Confidentiality of reports has been a major issue (Article 27)*


TO CUT THE COSTS OF REVIEW, THE NATIONAL REPORTS SHOULD BE LIMITED TO 3 PAGES !

Conduct of Review Meetings

- *Sub-groups may be established "for the purpose of reviewing specific subjects" (Art. 20.2)*
- *Contracting Parties to have "reasonable opportunity to discuss reports of others" (Art. 20.3)*
- *Preparatory meeting within six months (Art. 21.1)*
- *No more than three years between Review Meetings (Art. 21.3)*
- *Content of debates confidential (Art. 27.3)*

MEETINGS OF THE PARTIES—PROCEDURAL ASPECTS

- *Two week schedule for entire meeting*
- *Country Group format, rather than subject matter sub-groups*
- *Country Groups composed on number of reactors, rather than on geography or technology*
- *Oral reports by rapporteurs*
- *Final written report by consensus*
- *Final plenary hears oral reports; Limited comments by delegations*
- *Limited role for IAEA Secretariat*

Country Groups

- *Six Country Groups of 10-11 parties*
- *4 or 5 countries with NPPs in each group*
- *Chair moderates discussion (cannot chair session on his country's report)*
- *Each NPP country has about one day to present its report*
- *Some Parties receive hundreds of questions or comments*
- *Rapporteurs' oral reports contain most substantive evaluation*
- *Debates in CG's are confidential (Rule 20)*
- *Controversy over records of CG discussions resolved by agreement to record plenaries (Rule 42)*

WE STRONGLY SUPPORT THE PROPOSAL TO HAVE SIX COUNTRY GROUPS!

Summary Report of the Meeting

- *Parties may adopt document addressing issues and conclusions reached (Art. 25)*
- *Adoption by consensus*
- *Very short time for preparation and review of President's draft*
- *Summary reports have evolved (8 pages in 1999; 11 pages in 2002 and 13 pages in 2005; 7 pages in 2008)*
- *Very general report language can be "de-coded" to reveal more specific conclusions*

Did the Conventions make any difference for Fukushima?

- ***Given that the Fukushima reactors were designed, sited and constructed decades before the CNS, its impact was probably very limited***
- **Upgrades of certain reactor systems may have been influenced by CNS review meetings**
- ***Response measures and international assistance may have been assisted by the existence of and experience with the three conventions***
- **The CNS process provides a process for assessing the accident and possible strengthening of global safety culture**

Should more precise and mandatory international safety standards be adopted?

- *In principle, the rather general provisions in the CNS could be made more specific*
- **However, the IAEA Safety Standards Series already represents a detailed set of such standards.**
- *Given technological differences, it may be difficult to agree on much more specific standards or on making them mandatory*
- **Unless some form of international regulatory supervision is adopted, application of agreed standards will continue to be a matter for national regulatory control**

SHOULD MORE TIMELY AND COMPLETE INFORMATION ON NUCLEAR INCIDENTS BE REQUIRED?

- ***Advances in information technology (IT) probably makes notification requirements on nuclear incidents only a formal issue***
- **However, requirements for prompt and complete public information can have a positive influence on the responsiveness of industry and regulatory bodies**
- ***Confidentiality requirements in the CNS review process should be reviewed with a view toward making the reviews more open and transparent***

SHOULD INTERNATIONAL SAFETY REVIEWS OR INSPECTIONS BE MANDATORY?

- *IAEA Safety Assessment missions are voluntary and reports confidential*
- Implementation of IAEA recommendations depends on national regulatory decisions
- *Unless IAEA assessment/inspection results are made public, making them mandatory would probably not ensure full implementation*
- However, mandatory reviews as a condition of supply might be useful

ARE NEW INSTITUTIONS OR ARRANGEMENTS FOR NUCLEAR SAFETY NECESSARY?

- **The IAEA has a clear mandate under its Statute (Article III.A.6) to develop safety standards**
- ***Creating a new institution for safety would be complicated, time-consuming and costly***
- **Providing greater financial, human and technical resources to the IAEA for its safety program would be useful**
- ***Issues arising from the Agency's dual promotional and regulatory functions could be resolved through organizational and oversight measures***