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RISK ASSESSMENT OF THE DIFFERENT TYPES OF PLANT SITES/FACILITIES UNDER ARTICLE VI OF THE CHEMICAL WEAPONS CONVENTION (CWC)

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1. INTRODUCTION

The word "risk" refers to situations in which it is possible but not certain that some undesirable event will occur.

The term "risk" has a well-defined meaning in the industry, including the chemical industry. It can be described in the following way:

Risk: Probability of occurrence (of an undesirable event) * measure of damages = risk

Using this definition or other, similar means of quantifying risk, different kinds of risk become comparable.

In the context of the Convention, the undesirable event is the illicit production of chemical weapons by a State or a non-State actor.

Routine on-site inspections are considered to be confidence-building/transparent measures with the aim of verifying that the activities of the inspected site are consistent with the "purposes not prohibited under this Convention". The degree of confidence strongly depends on the frequency and the quality of the inspections, as well as on well-trained inspectors.

In order to maintain a high standard in the area of verification activities and therefore ensure confidence among the States Parties, we deem it necessary to further optimise the inspection activities of the Technical Secretariat.

Therefore, the following paper will concentrate on one aspect, which, in our point of view, deserves to be discussed in a more detailed manner: Which facilities/plant sites pose a risk to the object and purpose of the CWC?

2. ARTICLE VI PROVISIONS/VERIFICATION ANNEX PART VI TO IX

The right of a State Party to develop, produce, otherwise acquire, retain, transfer, and use toxic chemicals and their precursors for purposes not prohibited under the Convention is explicitly expressed (paragraph 1). The Member States are obliged to declare such activities, if they are above the declaration thresholds and subject them to the regime of international inspections and verification measures as defined by the Verification Annex (VA) of the CWC. Parts VI to IX of the VA describe the four different regimes which have to be applied to activities not prohibited under the Convention.

Depending on the type of chemicals, the declaration varies: production, processing, consumption, import, and export data have to be submitted to the Technical Secretariat. The following table lists the declarable activities:

Schedule	Production	Processing	Consumption	Export	Import
Schedule 1	x	-	x	x	x
Schedule 2	x	x	x	x	x
Schedule 3	x	-	-	x	x
OCPF	x	-	-	-	-

Note: x: declarable; -: not declarable.

The selection mechanisms for inspections are described as follows:

- For *Schedule 1 facilities* (SSSF, OFPP, OFRMPhP),[1] the number, intensity, duration and mode of inspections shall be based on a risk assessment, which takes into account the chemicals produced in the facility, the characteristics of the facility, and the nature of activities carried out there (Part VI, VA, paragraph 23 and 30).

- For *Schedule 2 plant sites*, the frequency and intensity of subsequent inspections shall be based on a risk assessment performed by the inspectors during the initial inspection, which takes into account the relevant chemicals, the characteristics of the plant site as well as the nature of the activities carried out there (Part VII, VA, paragraph 18).

- For Schedule 3 plant sites, the Secretariat shall randomly select plant sites for inspection through appropriate mechanisms which contain two weighting factors (Part VIII, VA, paragraph 14):

[1] SSSF: Single Small-Scale Facility; OFPP: Other Schedule 1 Facilities for Protective Purposes; OFRMPhP: Other Schedule 1 Facility for Research, Medical or Pharmaceutical Purposes.

(a) equitable geographical distribution; and

(b) information on declared plant sites available to the Secretariat, related to the relevant chemical, the characteristics of the plant site, and the nature of the activities carried out there.

The number of possible inspections per year is limited to the plant site level (Part VIII, VA, paragraph 15), as well as to the State Party level (Part VIII, VA, paragraph 16).

For other chemical production facilities (OCPFs), the selection of facilities for inspections shall be made randomly through appropriate mechanisms on the basis of three weighting factors (Part IX, VA, paragraph 11):

(a) equitable geographical distribution;

(b) the information on the listed plant sites available to the Secretariat, related to the characteristics of the plant site and the activities carried out there; and

(c) proposals by States Parties on a basis to be agreed upon in accordance with paragraph 25.

The number of possible inspections per year is limited to the plant site level (Part IX, VA, paragraph 12) as well as to the State Party level (Part IX, VA, paragraph 13).

3. THE BASIS OF RISK ASSESSMENT

Although the decision on "Assessment of the risk posed by a Schedule 2 facility to the object and purpose of the Convention" (C-I/DEC.32, dated 16 May 1997) was taken for Schedule 2 facilities only, the principles of risk assessments are applicable to all four regimes: i.e., Schedule 1, Schedule 2, Schedule 3, and OCPFs (DOC/PSF).

It is our view that a reasonable risk assessment of plant sites/facilities under Art. VI of the CWC consists of three pillars, which are:

(a) relevant chemicals at the plant sites;

(b) characteristics of the plant sites; and

(c) nature of activities carried out at the plant sites.

3.1. Relevant chemicals

The following may be considered when a risk assessment on chemicals has to be performed:

- the toxicity of the chemicals, or, for precursor chemicals, the end products produced with them (i.e., lethal or incapacitating toxicity);
- the quantity of chemicals typically stored at the plant site;
- the quantity of feed-stock chemicals typically stored at the plant site;
- the chemical structure (in order to evaluate how closely it is related to that of a toxic chemical listed in Schedule 1 and to determine whether it has, or can be expected to have, comparable properties); and

- whether it may be used as a precursor for the final single technological stage of production of a toxic chemical listed in Schedule 1, regardless of whether this stage takes place in the given facility or elsewhere.

In the "Guidelines for Schedules of Chemicals" (VA, Annex on Chemicals), the criteria for Schedule 1, Schedule 2, and Schedule 3 are well defined. For unscheduled chemicals (DOC/PSF chemicals) such guidelines are missing. Nevertheless, the General Purpose Criterion (Art. II) is applicable to all chemicals—regardless of whether a chemical is scheduled or not.

The CWC does not only provide a list of tightly regulated compounds, but covers **any toxic chemical** intended to be used for purposes prohibited under this Convention (such as chemical warfare), as well as those not yet synthesized (Art. II, paragraph 1(a) and paragraph 2). Therefore, the CWC is open-ended.

3.2 Characteristics of plant sites/facilities

To assess the risk based on the characteristics of the plant site/facility, the following may be considered (extract from C-I/DEC.32):

- process area (production capacity, process equipment);
- enclosed process equipment or process equipment that has a hood or hoods over it;
- physical layout (airlocks, ventilation systems, alarm system, air-treatment systems, control rooms, security installations, access restrictions);
- location (geographical, as proximity to inhabited area, etc.);
- safety equipment/procedures (antidotes, decontamination equipment, warning signs, protection equipment);
- assessment of capability and convertibility for initiating production and storage of toxic chemicals;
- potential for filling toxic chemicals; and
- dedicated or multipurpose facility.

3.3 Nature of activities carried out at the plant sites/facilities

To assess the risk posed by the nature of activities carried out at the facilities, it is important to know the following (C-I/DEC.32):

- whether the chemicals (scheduled or unscheduled) are produced, processed (for Schedule 2 chemicals only), consumed (for Schedule 1 and Schedule 2 chemicals only), or whether such activities take place in combination; and
- which activities, not directly involving the declared chemicals, take place at the plant sites/facilities.

4. RISK ASSESSMENT OF PLANT SITES/FACILITIES UNDER ART. VI

4.1 Schedule 1 facilities

4.1.1 Chemicals

Schedule 1 chemicals are considered to pose a high risk to the object and purpose of the Convention by virtue of their high potential for use in activities prohibited under this Convention, since they possess such lethal or incapacitating toxicity, as well as other properties that would enable them to be used as chemical weapons (VA, Annex on chemicals, section A, paragraph 1(b) (ii)). They have little or no use for purposes not prohibited under this Convention.

4.1.2 Characteristics and activities of facilities

Twenty-seven Facilities in 21 Member States have been declared; 25 of these facilities are run by governments; two facilities perform research for the respective governments.

According to VA, Part VI, section E, paragraph 22, these facilities shall be subject to systematic verification through on-site inspections and monitoring with on-site instruments.

Appropriate guidelines for a risk assessment that shall be the basis for the number, intensity, duration, timing, and mode of inspections for a particular facility shall be considered and approved by the Conference—this issue is still pending.

The distribution of the types of facilities is as follows (Background paper of the Secretariat, 25 May 2007 and 27 January 2003):

- 8 SSSFs
- 17 OFPP
- 2 OFRMPhP

The configuration of facilities declarable under Part VI of the VA is subject to the following restrictions:

The reaction vessels shall not exceed 100 litres, and the total volume of all reaction vessels with a volume exceeding 5 litres shall not be more than 500 litres. The production lines shall not be configured for continuous operation (Part VI, VA, section C, paragraph 9).

Four of the eight SSSFs pose a higher risk to the object and purpose of the Convention because of their size, their technical characteristics (space, equipment, and infrastructure), their significant handling capability (production and storage) and their tighter safety features (ventilation system and high fume-hood suction). They have reactors with volumes up to 30 litres. If the configuration was optimised, the production quantity could exceed one tonne of Schedule 1 chemicals. The major part of the overall declared quantities of produced, consumed, stored, and transferred Schedule 1 chemicals originates from these facilities. The remaining four SSSFs have very limited capability for the production of Schedule 1 chemicals in significant quantities.

Since entry into force (EIF), the OPCW has performed 182 inspections in 27 Schedule 1 facilities. In other words, every Schedule 1 facility has been inspected theoretically at least six times since EIF. The information—chemicals, characteristics of facility (standard laboratories,

glassware), activities, small quantities—gathered during these missions has confirmed that the OFPP and the OFRMPhP pose a lesser risk to the object and purpose of the Convention than the first four SSSFs mentioned above.

Figure 1 summarises the relevance in terms of chemicals, activity, quantities, and design of facility.

In 2006, 0.4 kg of Schedule 1 chemicals were transferred. Compared to the transfers of Schedule 2 chemicals (5,000 tonnes) and transfers of Schedule 3 chemicals (509,000 tonnes) this quantity is of low relevance to the object and purpose of the Convention.

4.2 Schedule 2 plant sites

4.2.1 Chemicals

Schedule 2 chemicals pose a significant risk to the object and purpose of the Convention because they possess such lethal or incapacitating toxicity, as well as other properties that could enable them to be used as a chemical weapon. They may also be used as a precursor in one of the chemical reactions at the final stage of formation of a chemical listed in Schedule 1 or Schedule 2A and therefore play an important role in the production of chemicals listed in Schedule 1 or Schedule 2A. They are not produced in large commercial quantities for purposes not prohibited under the Convention (Annex on Chemicals, Part A, paragraph 2).

From the toxicological point of view, the chemicals in Part A of Schedule 2 are considered to be of higher relevance than the chemicals of Part B, i.e.:

Relevance:	2A/A* > 2B.

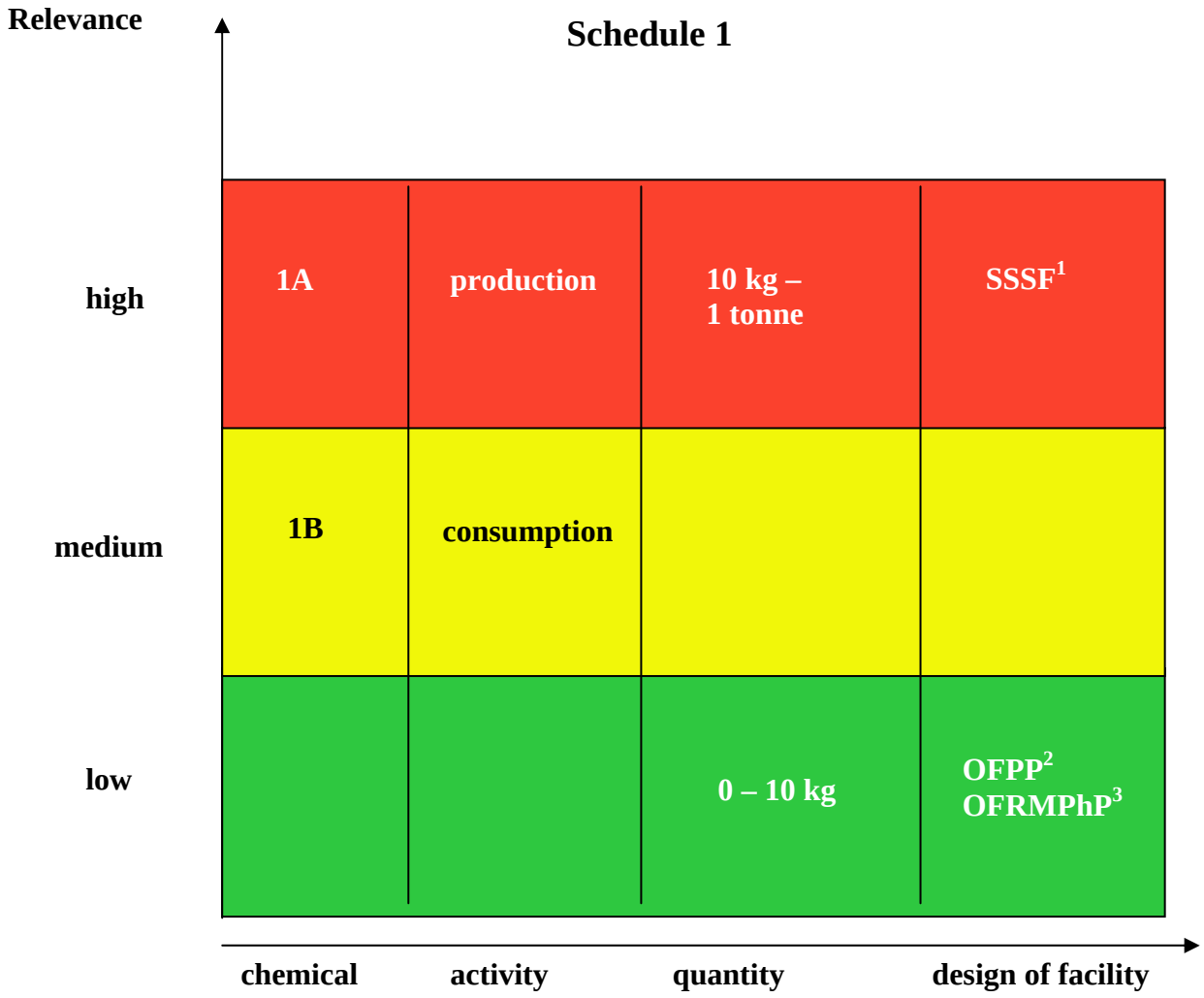

Fig.1: Summary of relevances considering the chemicals, activities, quantities and design of the facility; with: [1] Single Small Scale Facility, [2] Other Facilities for Protective Purposes, [3] Other Facilities for Research, Medical, Pharmaceutical Purposes

4.2.2 Characteristics and activities of facilities

In 2006, the 471 declared Schedule 2 plant sites (in 37 Member States) showed the following activity profile:

Profile number	Activity	Number of plant sites
1	No Production, Processing or Consumption (stopped activities with Schedule 2 chemicals)	54
2	Production	26
3	Processing	173
4	Consumption	125
5	Production and Processing	8
6	Production and Consumption	46
7	Processing and Consumption	24
8	Production, Processing, and Consumption	15
	Total	**471**

Out of the 471 declarable plant sites, only 141 in 21 States Parties are subject to inspections (Secretariat paper "Risk Assessment for Schedule 2 plant sites and frequency of inspection", dated 28 May 2007). Between EIF and the end of 2007, the Secretariat has performed 405 inspections in these plant sites. This means, every inspectable plant site has been inspected an average of 2.9 times.

The analysis (based on the nature of activities carried out, the relevant chemicals, and the quantities (C-I/DEC.32)) performed by the Secretariat in the year 2000 (EC-XXII/TS.1, 6 October 2000), resulted in three main groups of plant sites:

Group 1: Plant sites processing and/or consuming Schedule 2B chemicals, between 1 and 100 tonnes per year;

Group 2: Plant sites processing and/or consuming more than 100 tonnes and/or producing Schedule 2B chemicals, 1 to 500 tonnes per year; and

Group 3: Plant sites producing more than 500 tonnes of Schedule 2B chemicals and/or producing Schedule 2A and 2A* chemicals.

This approach was welcomed by Switzerland because it simplified the classification of the plant sites. It was unambiguous and took into account the three main risk factors referred to in C-I/DEC.32.

Nevertheless, it was and still is Switzerland's opinion that this concept should be amended slightly because processing-plant sites and consuming-plant sites do not pose the same risks to the object and purpose of the Convention.

Processing-plant sites are typically plant sites that buy the Schedule 2 chemical on the market, mix it with other ingredients in a simple mixing vessel (e.g., stainless steel with low corrosion resistance) that is not suitable for performing chemical synthesis. Companies producing polyurethane foams (where the Schedule 2 chemicals represent flame retardants), ingredients for the textile printing industry (such as thiodiglycol solutions as flow media, flame retardants), or ingredients for consumer products (dyes, inks, etc.) are representative of this group of plant sites.

Consuming-plant sites, on the other hand, are very often facilities equipped with reactors that are suitable for performing chemical synthesis. A typical plant site possesses multipurpose production units that use the Schedule 2 chemicals as starting material. The reactors in such units are made of highly corrosion-resistant materials in order to produce a wide variety of chemicals.

It is our point of view that the relevance of activities carried out in a plant site decreases in the following order:

Relevance:	production > consumption > processing

The third factor for successful risk assessment of a plant site deals with the characteristics of the plant site.

Multipurpose facilities are designed to handle various activities and technologies in order to comply with the requirements of the market. They are therefore very flexible and can be reconfigured (pipelines, tanks, reactors, filling stations, etc.) for the needed purpose in a very short time. Their activities are not limited to the declared scheduled chemicals only. These facilities are able to produce, process, or consume chemicals of the same family, including other scheduled chemicals, as well as unscheduled chemicals. Depending on the production strategy, they either produce batches or have continuous production.

On the other hand, the configuration process in dedicated facilities is designed to produce, process, or consume specific chemicals in higher quantities. The reconfiguration of such facilities for the production, the processing, or the consumption of other than declared scheduled chemicals, or scheduled chemicals in the same family as the declared chemicals, is not easy to make, because they very often consist of fixed installations (reactors, pipelines, filling stations, piping, etc). Batch production, as well as continuous production processes are possible in dedicated plants.

Assuming that both types of facilities show similar characteristics (process area, location, potential for filling toxic chemicals), the relevance of the type of facility is as follows:

Relevance:	multipurpose > dedicated

Based on these facts, the grouping of the plant sites should be as follows:

Group 1: Plant sites producing Schedule 2B chemicals in quantities of more than 500 tonnes and producing, processing, and consuming Schedule 2A and 2A* chemicals;

Group 2: Plant sites consuming and producing Schedule 2B chemicals in quantities up to 500 tonnes per year; and

Group 3: Plant sites processing Schedule 2B chemicals.

The risk decreases with the number of the group:	Group 1 > Group 2 > Group 3

Figure 2 summarises the relevance in terms of chemicals, activity, quantities, and design of the plant:

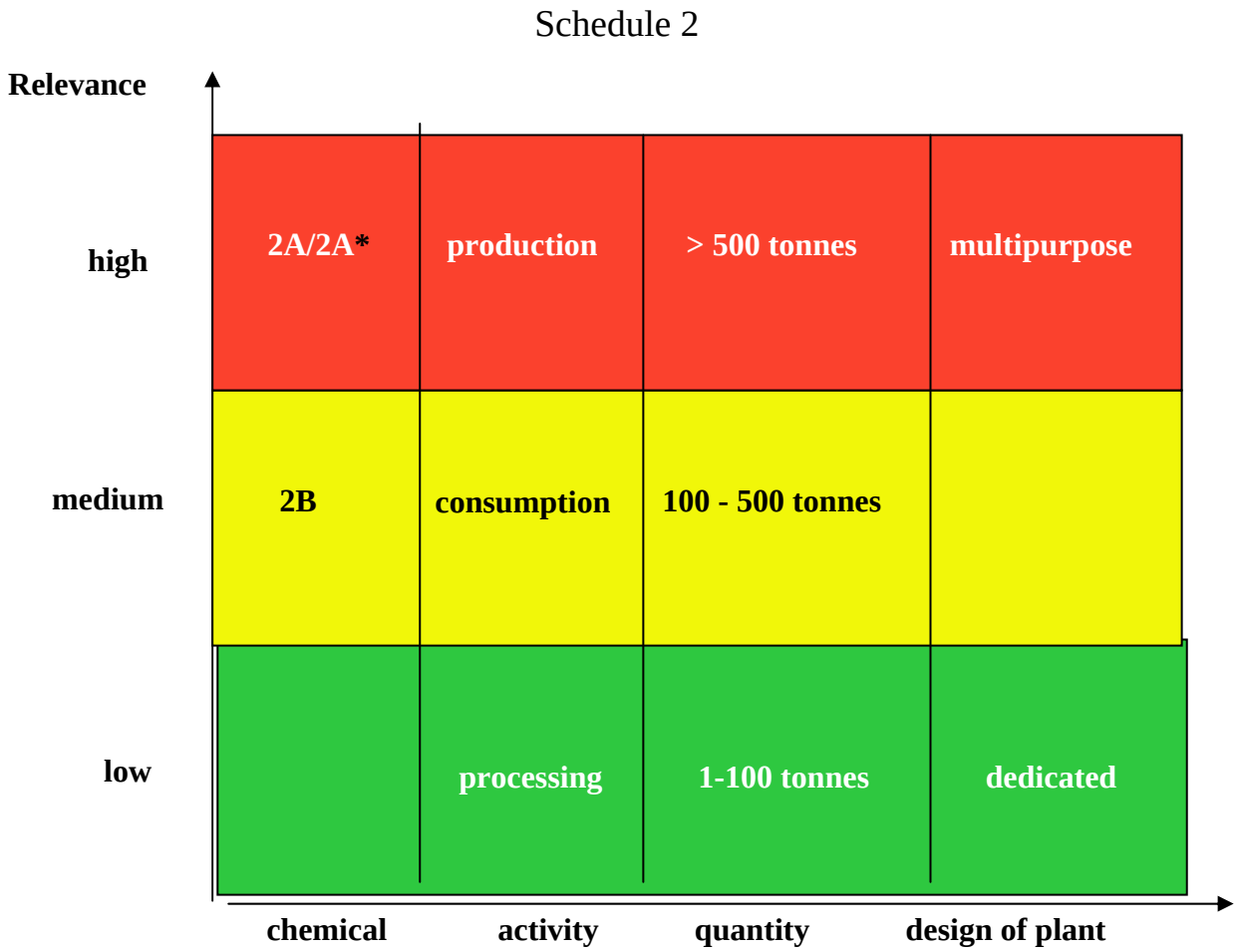

Fig.2: Summary of relevance considering the chemicals, activities, quantities, and design of the plant

4.3 Schedule 3 Plant Sites

4.3.1. Chemicals

Schedule 3 chemicals pose a risk to the object and purpose of this Convention because they possess, in part, such lethal or incapacitating toxicity, as well as other properties that might

enable them to be used as chemical weapons. By virtue of their importance, they can also be used in the production of one or more chemicals listed in Schedule 1 or Schedule 2, Part B. They are generally produced in large quantities/commercial quantities for purposes not prohibited under this Convention (Annex on Chemicals, Part A, paragraph 3).

Schedule 3 covers 17 chemicals that are identified by a CAS number. Some of these chemicals are highly toxic and have been used as chemical weapons in the past. However, nowadays it is rather unlikely that they will be used by state actors for purposes prohibited under the Convention.

From a toxicological point of view, the chemicals in Part A of Schedule 3 are considered to have a higher relevance than the chemicals belonging to Part B, in other words:

Relevance:	3A > 3B.

4.3.2 Characteristics and activities of facilities

In 2006, 34 States Parties declared a total of 504 Schedule 3 plant sites, of which 430 are inspectable. By the end of 2007, since EIF, the OPCW had performed 218 Schedule 3 inspections. Therefore, only every second plant site (50.7%) has been inspected.

According to the experience of the Secretariat (Background Paper, "Overview of the Convention requirements and their implementation under Article VI, Parts VI, VII, VIII and IX of the Verification Annex (VA) of the CWC", 25 May 2007), in most cases these plant sites are dedicated and operate continuously in order to produce the chemicals on a large scale (1,000 to 100,000 tonnes/year or even higher). For example, plants producing large volumes of phosgene and hydrogen cyanide are, in most cases, integrated with other process streams on site, which involve the production of other chemicals.

In these plants, Schedule 3 chemicals are produced with standard technology and within a similar process configuration. The configuration of such plants is therefore not very flexible, in terms of re-orientation within a short timeframe, to produce smaller amounts of other scheduled/unscheduled chemicals.

The trade in Schedule 3 chemicals involves quantities 100 times higher than the trade in Schedule 2 chemicals (VIR 2006, EC-49/HP/DG.1). In contrast to Schedule 1 and Schedule 2 chemicals, transfers of Schedule 3 chemicals to or from States not Party to the Convention are not prohibited.

Since the Schedule 3 plant sites declare their production quantity in ranges (i.e. B21 to B25[2], Declaration Handbook, Appendix 6) and the transferred declared scheduled chemicals are not

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2 Declaration Handbook, Appendix 6:

Code	Production Range
B21	$30 \leq P < 200$ tonnes
B22	$200 \leq P < 1{,}000$ tonnes
B23	$1{,}000 \leq P < 10{,}000$ tonnes
B24	$10{,}000 \leq P \leq 100{,}000$ tonnes
B25	$P > 100{,}000$ tonnes

known by the Technical Secretariat (only as aggregate national data), the verification can only assess the production throughput, the capacity of the plants and the purpose of production.

Based on the characteristics of the plant sites, the following risk assessment may also be applicable for Schedule 3 plant sites:

Relevance: multipurpose > dedicated (with batch > continuous to be applied in combination)

and

Relevance:	B21, B22 > B23 > B24, B25

Figure 3 summarises the relevances in terms of chemicals, activity, quantities and design of plant:

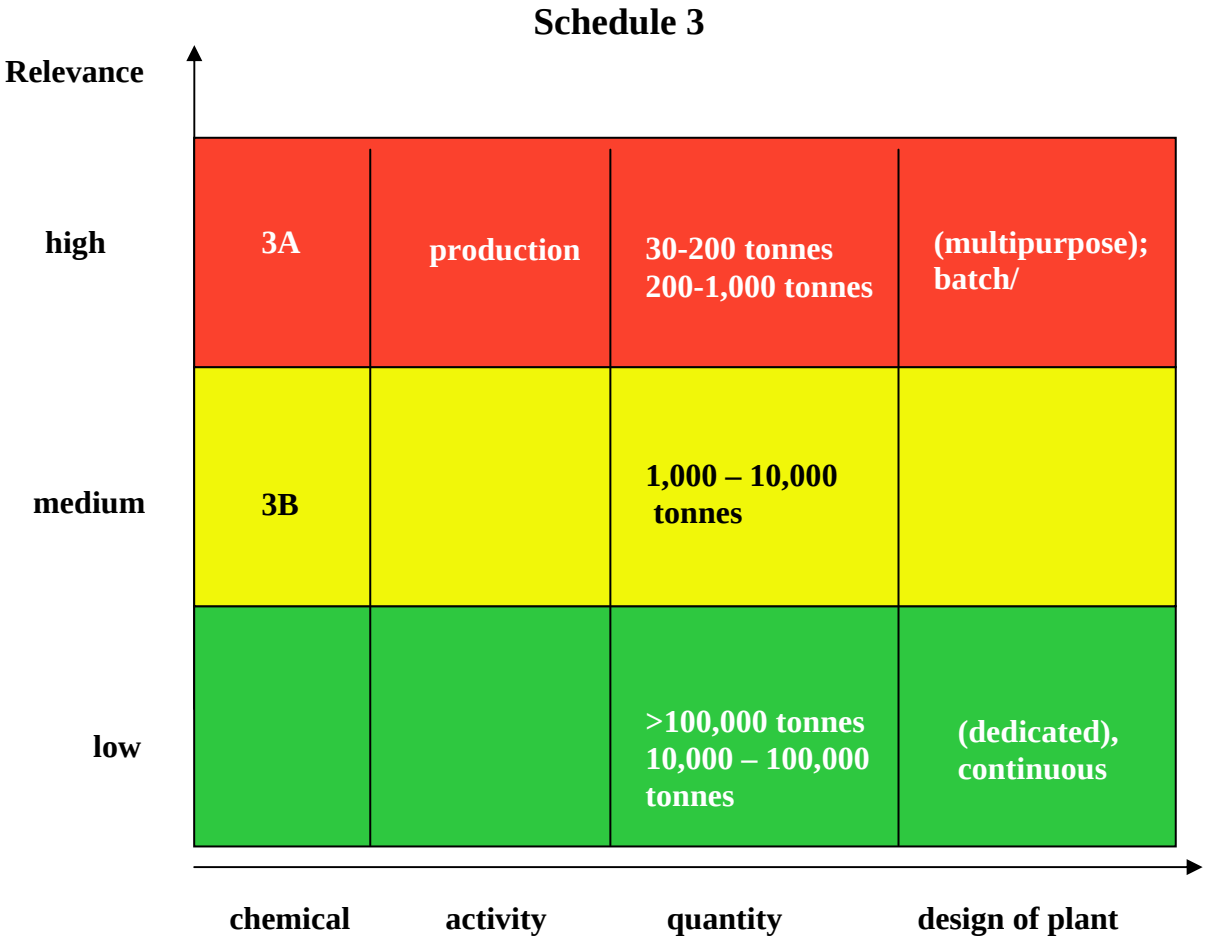

Fig.3: Summary of relevances considering the chemicals, activities, quantities and design of the plant

4.4 Other Chemical Production Facilities (OCPF)

4.4.1 Chemicals

In the Declaration Handbook, Section B, Chapter 3 (Definition and explanations in relation to declaration requirements),

"Discrete organic chemical" is defined as any chemical belonging to the class of chemical compounds consisting of all compounds of carbon except for its oxides, sulfides and metal carbonates, identifiable by chemical name, by structural formula, if known, and by Chemical Abstracts Service (CAS) registry number, if assigned;

and

"PSF-chemical" is defined as an unscheduled discrete organic chemical containing one or more elements phosphorus, sulfur or fluorine.

Despite the fact that these chemicals are not listed in the Schedules of Chemicals in the corresponding Annex on Chemicals, they are relevant for the purpose of the Convention (General Purpose Criterion). The weighting factors used for the selection of sites are risk-related. One of these factors deals with the main activities carried out there, i.e. with the product group codes, which were developed based on the 3-digit SITC code representing types of chemicals (http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=14).

Depending on the chemicals produced at the OCPFs, these plant sites can be divided in two sub-groups:

- PSF plant sites
- DOC plant sites

Phosphorus, sulfur or fluorine are the elements which are needed to synthesize the CW agents listed in Schedule 1. Therefore, PSF chemicals are of higher relevance to the objective and purpose of the Convention than DOCs:

Relevance:	PSF > DOC

Based on the types of chemicals (toxicological properties, structural formula, purpose of use) the PSF chemicals could be sub-divided into the following relevant classes (TS Backgroundpaper, 25 May 2007):

i) Insecticides, rodenticides, fungicides, herbicides, anti-sprouting products and plant-growth regulators, medicinal and pharmaceutical products;

ii) General PSF chemicals, such as dyes, pigments and flotation agents; and

iiii) Linear alkyl benzene sulfonates (LABS) and related products.

Accordingly, DOC chemicals have been sub-divided into the following three groups:

iv) Pharmaceuticals and food ingredients;

v) Different types of chemicals, produced in quantities below B33; and

vi) Bulk chemicals, such as urea, methanol, formaldehyde, vinylchloride, maleic acid anhydride.

The categories with the highest relevance are listed first, i.e.:

PSF chemicals: i) > ii) > iii) and DOCs: iv) > v) > vi)

4.4.2 Characteristics and Activities of Facilities

The total number of plants, the production range and the total number of PSF plants are incorporated, among others, as the weighting factors into the algorithm which determines the relevance of a plant site.

The production range and the product group codes are an indication of whether the chemicals are produced in a dedicated plant which is operating in batch or continuous process, or whether they are produced in a multipurpose plant operating in batch or continuous process:

Multipurpose, batch:	These plants are usually designed to produce a multitude of chemicals. Most of them are producing according to GMP rules in order to avoid cross-contamination. The flexible installations enable the plant to adapt quickly to the market demand. The production capacity varies from several kilograms to several tonnes per batch. Because of their flexibility, they can be operated to produce highly toxic, as well as bioactive chemicals.
Dedicated, batch:	These plants are generally designed to produce large quantities of bulk chemicals in batch process. The basic equipment is quite flexible and could be adapted, but in a less flexible way than the multipurpose batch plant.
Multipurpose, continuous:	These plants are designed to produce similar chemicals. The flexibility of the installations are rather limited, therefore the production of different types of chemicals is limited.
Dedicated, continuous:	These plants are designed to produce very large quantities of a single chemical. Typical representatives of such plants are producing methanol or urea. The engineering characteristic (fixed installations) is inflexible.

The relevance for the different process designs is shown below:

multipurpose batch > dedicated batch > multipurpose continuous > dedicated continuous

By the end of 2007, the Technical Secretariat had performed 521 inspections (of which several were re-inspections). This corresponds to about 10% of inspectable plant sites (VIR, 2006).

Figure 4 summarises the relevances in terms of chemicals, activity, quantities and design of facilities:

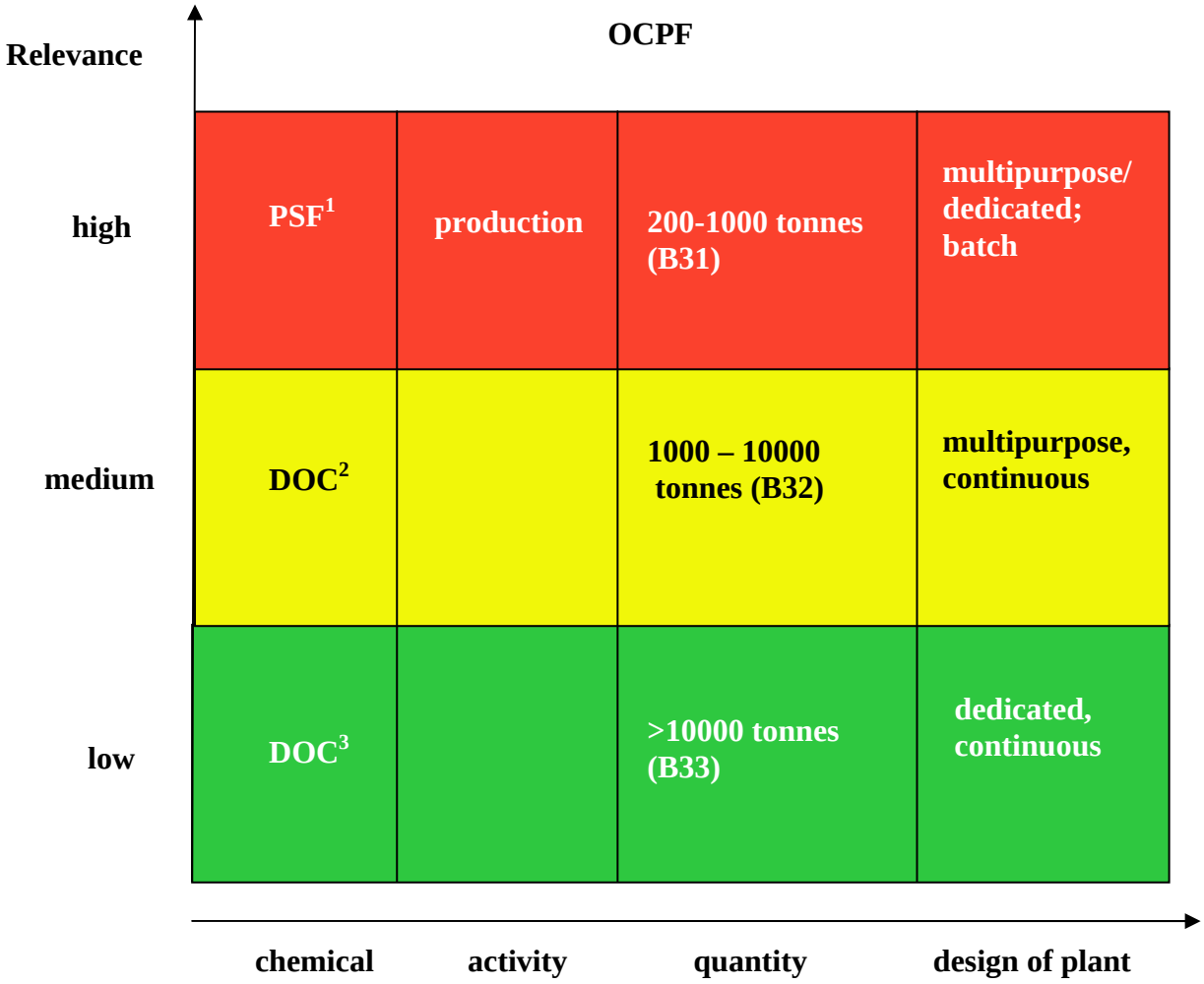

Fig.4: Summary of relevances considering the chemicals, activities, quantities and design of the plant, with

1: i) Insecticides, rodenticides, fungicides, herbicides, anti-sprouting products and plant-growth regulators, medicinal and pharmaceutical products

ii) General PSF chemicals such as dyes, pigments and flotation agents

iiii) Linear alkyl benzene sulfonates (LABS) and related products

iv) Pharmaceuticals and food ingredients

2: v) different types of chemicals, produced in quantities below B33

3: vi) bulk chemicals, such as urea, methanol, formaldehyde, vinylchloride, maleic acid anhydride

5. SUMMARY

In order to keep a high standard in the area of verification activities and therefore ensure the confidence between the States Parties, we deem it necessary to further optimise the inspection activities of the Technical Secretariat. The optimisation can be reached by concentrating the number of inspections on plant sites / facilities which are more relevant to the objective and purpose of the Convention than others. The identification of the relevant plant sites should be based on risk assessments (in case of Schedule 1 and Schedule 2) and on the introduction of risk-related weighting factors into the corresponding algorithms (in the case of Schedule 3 and OCPF).

- For the risk assessment of a declared plant site / facility, it is imperative to consider not only the chemicals, but also the characteristics of the plant site / facility, as well as the activities which take place at the plant site / facility.

- All declared Schedule 1 Facilities are government-owned or work for the government and have been inspected more than 6 times in the past (systematic inspections). Based on these inspections, the Technical Secretariat identified only 4 (out of the 27) facilities which have the capabilities to produce chemical weapons agents in significant quantities, i.e. in the range of tonnes. The other 23 are considered to be less relevant due to their technical configuration and their laboratory-scale equipment. The verification of production, consumption, storage and transfer activities (i.e. down to milligrams) resulted in an excellent knowledge of the characteristics of the inspected facilities. Activities prohibited by the Convention can be excluded.

- The plant sites producing Schedule 2B chemicals in quantities of more than 500 tonnes and producing, processing and consuming Schedule 2A and 2A* chemicals are more relevant than the plant sites consuming and producing Schedule 2B chemicals up to 500 tonnes/year. The least-relevant plant sites in the Schedule 2 regime are the processors (such as polyurethane foamers, textile industry) which have no production capacity at all. Until the end of 2007, every inspectable plant site had been inspected 2.9 times on average. Because production, processing and consumption quantities are declared in precise numbers, the verification activities are performed in a detailed manner. Potential proliferation of declared chemicals can be uncovered easily.

- Most of the Schedule 3 plants lack the flexibility to produce other scheduled chemicals than the ones they were designed for. 85% of the declared plant sites produce more than 200 tonnes. Therefore, the risk that such plant sites are producing other scheduled chemicals seems to be rather low. Plant sites producing Schedule 3A chemicals have a higher relevance than those producing Schedule 3B chemicals. On the other hand, the large production quantities, which are declared in ranges only, as well as the brisk trade of the Schedule 3 chemicals on the global market cause concern in terms of proliferation. Only approximately 50% of all inspectable plant sites have been inspected by the Technical Secretariat so far. Due to the fact that production quantities of Schedule 3 chemicals are declared in ranges, the possibility of revealing potential proliferation of Schedule 3 chemicals during inspection is limited.

- The highest number of declared chemical production facilities are the OCPFs. The characterization of OCPF plant sites can be related to the chemicals they produce as well as to the process and engineering characteristics. Plant sites producing chemicals containing PSF have a higher relevance than plant sites producing DOC only. In

addition, PSF chemicals can be subdivided into three groups: [(i) Insecticides, rodenticides, fungicides, herbicides, anti-sprouting products and plant-growth regulators, medicinal and pharmaceutical products; (ii) general PSF chemicals, such as dyes, pigments and flotation agents; and (iiii) linear alkyl benzene sulfonates (LABS) and related products]. Accordingly, DOCs can be subdivided into three groups, namely: (iv) pharmaceuticals and food ingredients; (v) different types of chemicals, produced in quantities below B33; and (vi) bulk chemicals, such as urea, methanol, formaldehyde, vinylchloride, maleic acid anhydride. The most relevant process configuration is the combination of batch production in a multipurpose plant, followed by batch production in a dedicated plant. Continuous production in either a multipurpose or dedicated plant is considered to be the least relevant process. It is evident that, from an engineering point of view, corrosion-resistant hardware is of higher relevance than the equipment built of stainless steel. Only a minority of the inspectable facilities have been inspected so far. Due to the fact that production quantities of DOC/PSF chemicals are declared in ranges, revealing potential proliferation of such chemicals during inspection is limited. Only about 10% of all inspectable OCPFs have been inspected so far. Figure 5 resumes the inspection intensity of the plant sites / facilities under Article VI:

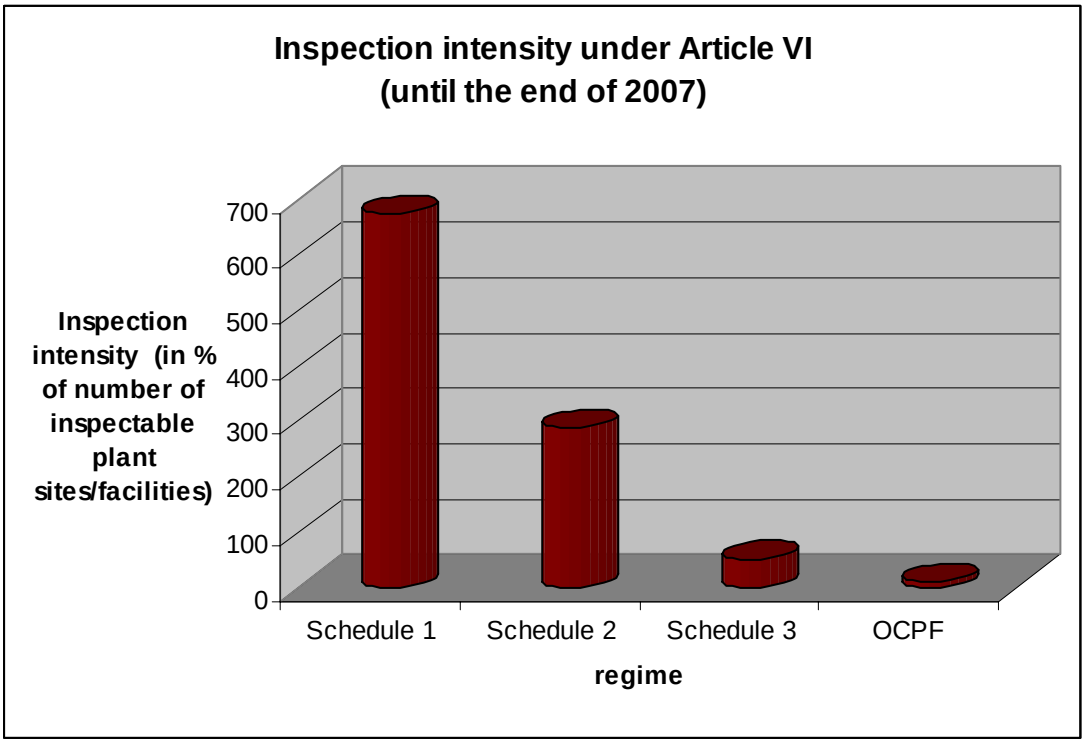

Fig. 5: the inspection intensity of the plant sites /facilities under Article VI

6. CONCLUSION

6.1 The risk assessment of a plant site / facility should not only be applied for Schedule 1 and Schedule 2 facilities, but should also be an integral part of the assessment of relevance for Schedule 3 plant sites and OCPFs.

6.2 The risk assessment of a plant site / facility consists not only of the assessment of the chemicals, but includes the process, as well as the engineering characteristics of a plant site / facility.

6.3 A risk assessment which includes all three factors does not necessarily reflect the hierarchy of the Schedules, but identifies the plant sites / facilities of real relevance to the objective and purpose of the Convention.

6.4 The information content in the declarations submitted to the Technical Secretariat of the OPCW does not allow to assess the relevance of a Schedule 3 plant site or an OCPF in an appropriate manner. This lack of information can only be compensated by amending the corresponding declaration forms (main activities, Form 3.3 and Form 4.1), and by inspections.

6.5 While all Schedule 1 facilities and Schedule 2 plant sites have been inspected several times and their risks have been assessed, there is a significant lack of the assessment of relevance to the objective and purpose of the Convention in the area of Schedule 3 plant sites (only 50% known through inspection) and OCPFs (only 10% known through inspection). This situation has to be improved.

6.6 In order to increase the confidence among States Parties and optimize the verification activities further, verification activities should focus on the relevant plant sites which have been identified by appropriate assessments.

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