# Interoperability Through Education, Training and Exercises - Simulations as a Means for Regional Cooperation with PfP Simulation Network as an Example

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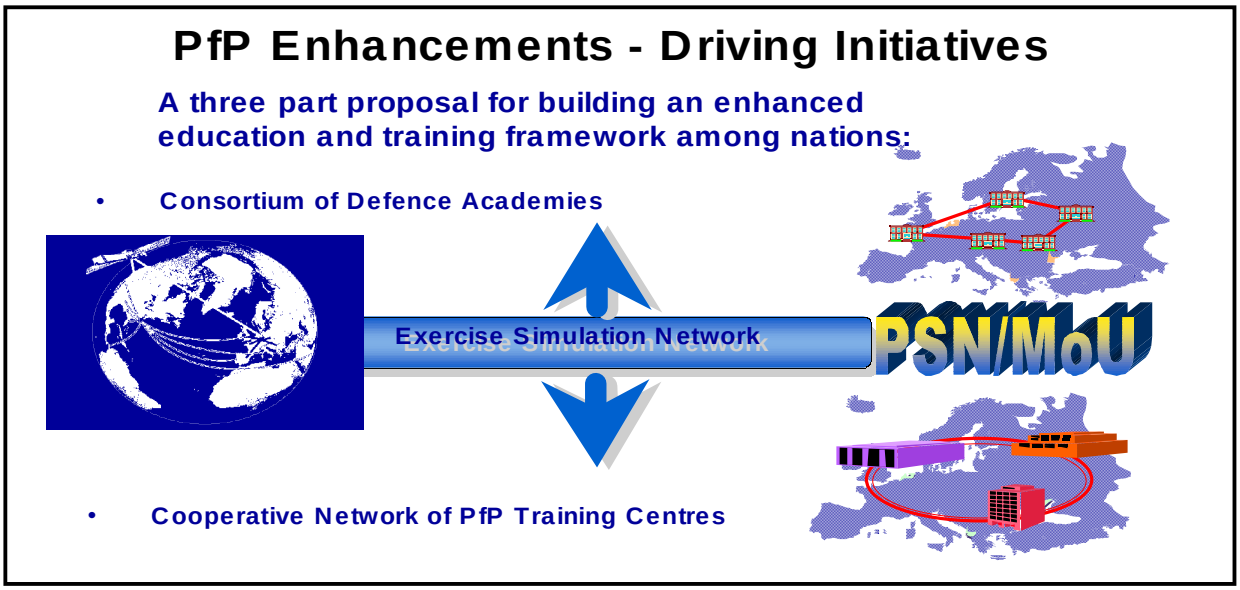
***Abstract***

On 12 June 1998, as part of his presentation to a Euro-Atlantic Partnership Council (EAPC) meeting composed for forty three counterpart allied and PfP partner ministers of defense, US Secretary of Defense William Cohen outlined a new vision for Partnership for Peace training and education. Titled "Towards a Cooperative Security Network for the 21st Century," the Secretary's intervention urged establishment of an array of cooperative efforts to be approved by the time of the April 1999 Washington Summit. It featured the PfP Consortium of Defense Academies and Security Studies Institutes, the Partnership for Peace Exercise Simulation Network and the Cooperative Network of PfP Training Centers as the three major initiatives.




Interoperability towards NATO-standards for Operations Other Than War and espacially Peace Support Operations requires both basic education, training and exercises. As there are no common Command, Control and Informations Systems developed for operations with participants outside NATO training and exercises will be hampered thereof. One means to overcome this shortage is PfP Simulation Network through which both training and exercises can be executed with a substitute to NATO $C^2IS$. PfP SimNet has now been ”in action” since April

1999 with the demonstration at NATO/EAPC Summit, exercise VIKING 99 in November/December 1999 and PEACE SHIELD 2000 in July 2000.
One of the working areas within the Consortium is Advanced Distance Learning, where distributed simulation may serve as a supporting tool.
PfP SimNet is a system of systems to which anyone can hook up if suitible on a distributed way for $C^2$ training and exercises. The systems however operate in real-time why they are not for the moment the best means to Security Studies Institues in their task to evaluate different plans or courses of actions during a live operation.
However, the main message is that PfP Simulation Network has proven to be an available and suitible means for the members of the Consortium in their education and training but also for exercises in order to achieve interoperability. Based on the basic configuration of and using the experiences from exercises with PfP SimNet a similar system could very well be developed in any region of the globe.

## *1. What is interoperability and the requirements thereof*

The base for a successful cooperation is interoperability. The PfP Training and Education Enhancment Programme (TEEP) provides the advice on interoperability and identifies the requirements for distance learning and simulation.
Although self-differentiation and open for all are principles for PfP, interoperability remains the common ground between NATO and the Partners. Military advice on essential areas of interoperability for Partners has been introduced and reflected in PfP Planning and Review Process (PARP) ministerial guidance. These essential areas include:

a. The ability to communicate effectively (to include language, procedures, and terminology).
b. Command and control arrangements.
c. The understanding of alliance military doctrine, standards, and procedures.

Clearly Partner interoperability with NATO can be facilitated through language training and training of NATO concepts, doctrines, and procedures. Specific interoperability requirements of each Partner can be obtained through a comprehensive review of their Military Interoperability Requirements (MIRs), Military Tasks for Interoperability (MTIs), and Partnership Goals (PGs).
The following priority areas for the PfP TEEP are based on experience gained during exercises and NATO-led PfP operations and inputs from the Partners:

(1) Language: basic and specialised training and NATO terminology at operational and tactical levels;
(2) Practice of staff procedures;
(3) Command and Control arrangements;
(4) Understanding of Alliance military doctrine and standards;
(5) Training of staff officers and NCOs for a Combined and Joint environment.

Regarding the need for an electronic network, a basic NATO document states that "a complete electronic and secured network is needed to support an efficient planning, execution, and feed back process. The absence of this tool could constitute the weakest point of the PfP education and training structure of the future." The need for a dedicated network that supports coalition education and training cannot be overemphasized. However, the issue of a secure network is of concern. The only truly secure network able to serve a large group of geographically separated users is a dedicated Wide Area Network (WAN) only connected to authorized user sites. This has limited usability from the standpoint of access to the vast array of data available on the global Internet. Firewalls and internal security practices can protect a dedicated network. This implies that an existing, usable network topology might not be a viable option for this PfP network. Current network solutions can be leveraged if the need for a secure network can be relaxed until such time as cryptologic or multilevel security solutions are developed.
It is at the same time essential to point out the importance of reflecting the real world for the training audience and this could very well mean that communications requirements for an information management system are rather minimal (phone/radio/fax)

The following have been advanced as the most current military requirements for individual distance learning within the context of PfP education and training:

a. General knowledge of NATO operational language according to STANAG 6001.
b. Basic knowledge of the generic NATO working environment, for example, internal structure of a Land Forces headquarters from G1 to G6 (ATP-35(B)); map symbology; or legal arrangements for participation in collective defence.
c. Specialized language terminology, for example, basic words, acronyms, and mission specific expressions such as those used for mine clearing operations or close air support.
d. Knowledge and practice of NATO staff procedures, for example, exercise planning, air defence procedures, medical $C^2$ procedures, etc. Knowledge and use of operational messages such as SITREPs, ASSESSREPs, FRAGOs, MEDEVAC, etc. in a NATO language.

For other regions of the globe similar requirements can be advanced but then outgoing from actual "coalition structure" (bi- or multilateral agreements).

## *2. What is PfP Simulation Network?*

Because of severe constraints in time, money, personnel and access to units and terrain a need for simulations defined as "replication of reality as much as possible with models used in a game-engine (computer)" is imminent in order to enhance the ability to conduct operations. This is for most if not all states true both on a national and an international basis.
In order to achieve true interoperability it´s not sufficient with only language training and formal staff-procedure training like the courses at schools and training centers. The latter are however essential as basic foundation for the whole concept.
Our technological standard in simulation together with knowledge and experiences in Peace Support Operations has made Sweden interesting as a "hub" for international computer-assisted command post exercises and the concept of PfP Simulation Network (PSN), originating from a

vision phrased by US Secretary of Defence William Cohen 1998, has been established based on an MoU between Sweden and USA from November 1998. The aim and objectives with PSN has been identified as
"Enhance the ability to conduct operations within the PfP framework (operations other than war) through designing, demonstrating, and implementing an improved Computer Assisted Exercise Program."

Objectives for the next 5 years are:

- Improve/standardize modeling and simulation capability.
- Publish minimum requirements for communications technology and demonstrated systems architectures.
- Develop a mechanism for scheduling, planning, and conducting exercises.
- Identify doctrine, tactics, techniques, and procedures for Peace Support, Search and Rescue, Humanitarian Relief, and other PfP agreed operations.
- Coordinate technology with defense academies and PfP training centers in common areas such as distance learning**.**

The main elements in the system are

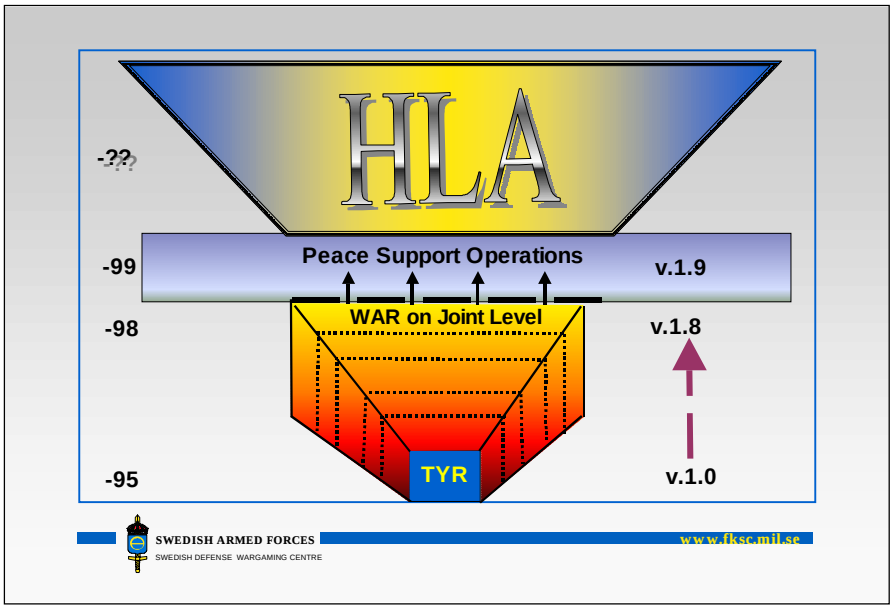
- Distributed simulation, defined as "a simulation where the operator works remotely with one or several game-engines connected to a system"
- Information management system based on Internet
- Videoteleconference capability between sites

All to serve as a means for $C^2$-exercises forcused on just Operations Other Than War (OOTW) on Combined Joint Task Force Level (CJTF) and below.

The training will in the future not only be on CJTF-level, so therefore the instruments (game-engines) must meet the needs for all levels concerned.
Our experience from "live" PSOs is also that it´s a much shorter way from top (polical level) to bottom (patrols etc) in those types of operations than in the case of war.

For $C^2$-exercises Swedish Defence Wargaming Center (SDWC) bases its capacity on one single system, called TYR after one of the old Viking-aesirs.

SDWC was established in 1994 and the first version of TYR wasoperational in 1995.
It is built on modules containing different elements such as orders for movement, detection, engagement and weapons-effect.




TYR has been developed primarily for war-fighting on Joint Level for national purposes.

A version 1.9 has been developed during 1999 and was used for the first time for simulations during VIKING 99, the first ”in the spirit of” PfP CAX executed in November-December last year.

TYR 1.9 uses what was common from 1.8, translated into English and with added rule-sets for PSO. The number of different orders has been more than doubled because of the complexity within a PSO compared to war-fighting.

In this game-engine single airplanes, ships and ground-patrols can be simulated and then aggregated up to joint level. Some non-military activities can als be simulated, primarily movements.

By using only ONE system (TYR) for all levels the problems with communications between various instruments or simulation-systems have not yet been met even though the experiences from VIKING 99 however clearly indicate the need for HLA-compliance for future use. HLA-compliance will also contribute to strengthening cooperation as more than one game-engine can be used simultaneously and thereby multiplying the training effects.

TYR is today not HLA- compliant but will be so from late next year, especially in order to meet the special requirements from training on lower levels ( brigade- battalion- company), where use of both constructive and virtual simulation is necessary for creating the reqiured ”realistic” environment.

Virtual simulations can today be made with means provided by a number of different developers. Very few of them are however HLA-compliant.

### *3. What has been achieved?*

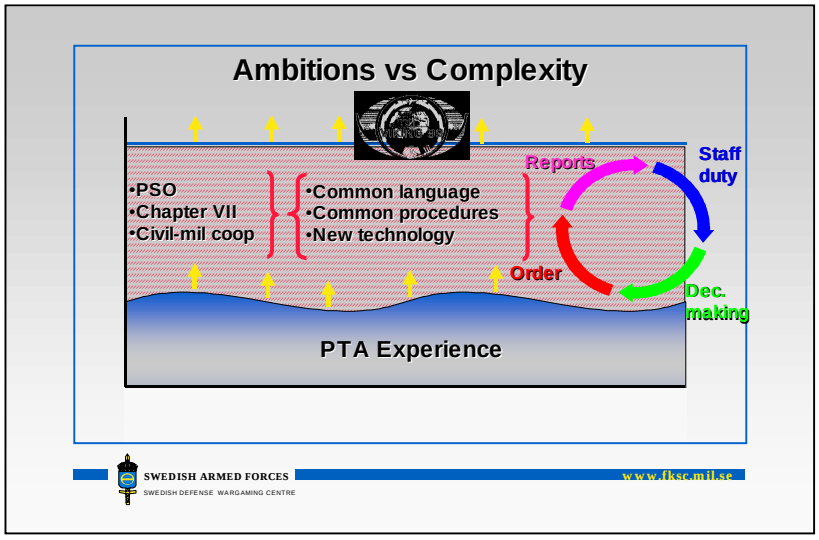
The first major application of this MOU was a PfP Simulation Network demonstration conducted in conjunction with the North Atlantic Treaty Organization (NATO) Summit in Washington, D.C., in April 1999. In the Final Communiqué of this Summit, the EAPC Heads of State called for a PfP Simulation Network. The first exercise using the PfP Simulation Network concept was the Sweden-sponsored Viking 99, an "In the Spirit of PfP" exercise conducted in November 1999. Planning has begun for a follow on exercises in 2000 and 2001, which are identified as PEACE SHIELD 2000, PEACE SHIELD 2001 (both US sponsored) and VIKING 01 (sponsored by SDWC).

Both exercises during 1999 have been considered as successful and PSN can now well serve as a means for the other two initiatives

- Consortiun of Defence Academies and Security Studies Institutes
- Cooperative Network of PfP Training Centers

which means that it can be used both for basic education and training as well as for preparations for "live operations" but also for exercises on national or multinational and multifunctional basis.
To note is that all simulations are made in real-time with possibilities to stop, replay, make magic moves, make analyses during and after the exercise and after action reviews.

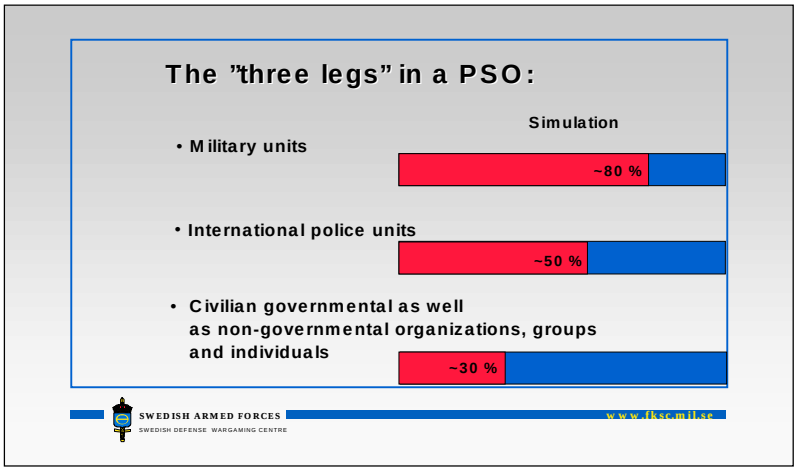
In any exercise the training audience has various experience once starting. There must always be a gap between that level and the level of complexity and ambition in the exercise. The aim and objectives will set the frame for scenario, resources etc as well as for the required competence with the training audience.




In VIKING 99 the PTA was exposed to a very complex but realistic scenario, to new technic for many of the participants, to new (NATO) procedures, to a new and for many uncommon language and at the same time demands on filing reports, accomplish staff-work, make decisions and issue orders.

As was indicated in the beginning operations other than war have a complexity built-in because of the involvment of military as well as police and different civilian authorities.
The military is not always taking the lead but is always restricted in action in one way or an other. The participating parties – military,police, GOs, NGOs and PVOs - will also have different objectives, sometimes contradictory

For simulation of operations other than war the complexity of such an operation leads to a vast number of new rules of engagements and restrictions in action compared to warfighting.
Simulation of military units is well at hand. Almost everything can today be simulated. When it comes to simulation of non- military actions not very much has so far been developed, basically only simulation of movements.




### *4. What lies in the future?*

To make the Partner States really interopeble continous efforts have to be made in

- Language training, which is a national responsibility
- Education in M&S, which is a task for the providers of simulations-systems
- Develop technics for
  - Reduction of preparation time
  - Improve connectivity
  - Reduction of need for qualified communications-systems (narrow bandwidth etc)

all in order to make PSN a real means for all of those who want to participate. One intersting example of technic to test and hopefully use is the thin-clients concept.

When it comes to PSN the main challenges for the futire can be summarized as

- Introduce the thin client concept, which meets the needs mentioned above, as it looks today
- Make the game-engines HLA-compliant
- Establish a realistic connection to the $C^2$-systems used in ”live PSO”
- Man the training facilities making frequent exercises possible. Without training and exercises no command and control skill be enhanced.

## *5. Concluding remarks*

The Consortium of Defence Academies is called ”the Consortium of the willings”. I will characterize PSN as ”the simnet of the willings” By promoting PSN, its aim and objectives and our philosofy on our homepage as well as at different symposiums, seminars, conferences and fairs the interest for ”hooking up” to the system will hopefully further increase.

Preparations for actions in order to restore peace and stability in a region include various kinds of training. Command and Control in multinational and multifunctional environment is difficult to execute if not the mentioned requirements are met. A common language, common staff-procedures, connectivity and common view on the tasks to fulfill are factors of crucial importance for success. A simulation network like PSN could very well serve as a means for better understanding of cooperation and ability to conduct operations other than war.

Lots more can be said but I hope that this short presentation has given you a picture of where we are and where we´re heading when it comes to training and exercising towards interoperability. On our website www.fksc.mil.se it´s possible for those of you who so wish to follow the development. This presentation this additional slides is already available there.