

A synchro-diachro approach to question the development of a human and organizational factors (HOF) network

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Introduction

Since 1998, CEA, as operator of nuclear facilities which are dedicated to research on nuclear fields, has implemented a HOF approach in relation to the safety analysis. In this context a HOF network has been set up.

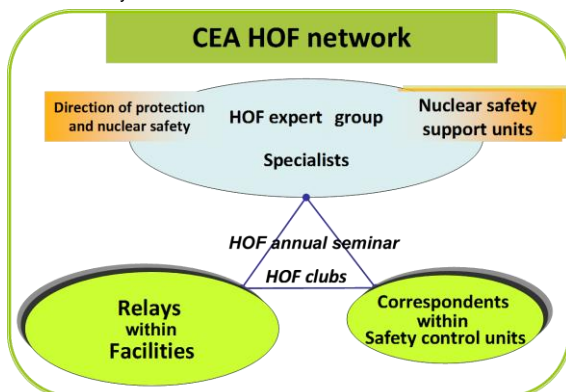
This communication presents a dual approach to question the development of a HOF network. This approach is based on synchronic and diachronic ways [1], hence the name: "synchro-diachro". An illustration is presented. It comes from our experience feedback at CEA about the development of our HOF network.

Three parts are presented, in this communication, in order to answer three questions. First, what are a synchronic way and its applications to the HOF network at CEA? Next, the same question concerning the diachronic way. Finally, what is the interest of combining the two ways in a synchro-diachro approach?

1. The synchronic way

The synchronic way focuses on the development of a HOF network at one moment of its development. It is like taking a picture. It permits to point out some characteristics of the functioning of a HOF network. These characteristics are here related to the complex systems theory, and especially to the concept of dialogical principle, proposed by Edgar Morin [2]. Then, these characteristics are dialogical pairs. The two elements of this kind of pairs are both opposite and complementary to one another. The existence of dialogical pairs is considered as successful conditions for the efficiency of HOF networks [3].

In 2012, three pairs were considered at CEA: specialists – non specialists of our HOF network, centralized – distributed human resources in the network, and, local – organizational factors levels of HOF methods to analyze the working situations. The first two pairs are related to the organization of a HOF network. At CEA, the HOF network is a set of actors composed of HOF specialists and non-specialists called relays and correspondents. The relays and correspondents work respectively inside facilities or inside specific departments dedicated to manage evaluations of the safety of facilities.



The third pair is related to the methods which are used to analyze the working situations. At CEA, these methods are called microscopic – macroscopic approaches.

Two criteria are considered as necessary conditions for being a dialogical pair:

- the size of the difference between the elements of a pair which has to be sufficient (for example the difference of level of qualification between the specialists and the non-specialists) ;
- the balance between the sizes of the elements of a pair which has to be sufficient too (for example the balance between the number of specialists versus relays and correspondents in a center of the CEA). Here, it is more a question of ratio between quantitative variables related to the two elements. In our example it concerns the ratio between the number of people which seems to be equal to around seven: is there a "magical ratio seven" (by analogy with the magical number seven [4]) for the pair specialists – non-specialists?

A practical way when considering the dialogical pairs: look at the differences and the ratios which exist between the two elements of a dialogical pair. Examine how to look for and maintain the right differences and ratios.

2. The diachronic way

The diachronic way focuses on the succession of steps of development of a HOF network. It is like using a video camera. It could be done with a model (the Greiner model [5]) which proposes different steps of the development of organizations. Each step is named as a thematic of development. They are called creativity, direction, delegation, coordination, collaboration and extra-organizational solutions.

In 2011, a communication about this diachronic point of view, using the Greiner model, was presented [6]. It was shown that the position of our HOF network in the scale, proposed by Greiner, depended in fact on the thematic which is considered. For example, concerning the delegation, since a CEA center integrated in 2015 a HOF specialist, it could be considered that our network is still in this step. But nowadays, according to another thematic (extra organizational solutions), our network seems to be located in the beginning of this last step of the Greiner model if we take into account the cooperation with a university in order to supervise researchers.

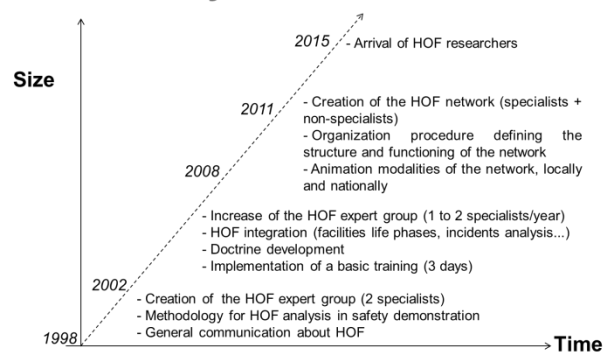
In other words, there is more an overlap of thematics than a succession.

The Greiner model



The evolution of the HOF network of the CEA has been considered for about eighteen years. In 2015, HOF researchers entered our HOF network to provide new knowledge.

History of the HOF network



A practical way when considering the Greiner model: think about the next thematic of development according to this model. Regard this picture as a possible future and examine what it could induce for nowadays works.

3. The interest of combining the two ways in a synchro-diachro approach

3.1. Using a diachronic way as a complement of a synchronic one

Let us keep in mind that a diachronic way of a system leads to look for new supplementary conditions for efficiency since, according to this point of view, a system is generally not steady. It induces a questioning. For example, three pairs were presented in 2012 [3]. But nowadays, a supplementary pair (specialists – researchers) is progressively being built. Consequently, the three first pairs can be considered as conditions for the working of an intermediate aged HOF network...

3.2. Using a synchronic way as a complement of a diachronic one

Considering a synchronic way using dialogical pairs brings supplementary characteristics for each step of the Greiner scale. For example, the formal existence of the pair centralized – distributed human resources in the network cannot be possible before the delegation step.

Then, introducing dialogical pairs in the Greiner model permits to compare more easily the evolution of different systems since the duration of each step may be very different from a system to another.

Conclusion

The HOF network of the CEA gradually grows to become an extended HOF network which consists of HOF specialists, relays, correspondents, researchers and also subcontractors (HOF consultants). Thus, some new dialogical pairs should certainly appear too if this new system (extended HOF network) is considered... and it might be a new application of the Greiner model which includes, afterwards, an identity crisis.

References

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