Benefits of using a declarative web portal to make the additional protocol declarations -application with the french portal pastel

Lucie Millot

BENEFITS OF USING A DECLARATIVE WEB PORTAL TO MAKE THE ADDITIONAL PROTOCOL DECLARATIONS – APPLICATION WITH THE FRENCH PORTAL PASTEL

Lucie MILLOT
IRSN
Fontenay-aux-Roses, France
lucie.millot@irsn.fr

Abstract

The paper will present the French Additional Protocol (AP) declarative web portal PASTEL and benefits of using it. In order to support IAEA mandates, France, as a Nuclear Weapon State and important nuclear industrial actor, has decided to develop an additional protocol web portal to be more efficient and to improve this registration. This portal was developed in 2014 and used the first time in 2015. On the one hand, the paper presents the technical organization put in place to do declaration and explains the reasons that led France to develop such a device. Then, it explains how the portal allows us to carry out the French obligations thanks to its specific tools. On the other hand, it focuses on the French experience and the lessons learned by the use of PASTEL for three years. It outlines benefits of PASTEL with a study of registrants' behaviorbehaviour. This study shows that PASTEL allows both for registrants and state authority, to save time and improve efficiency. One of the biggest challenges is to make the registrant feel concerned by AP registration. If training and documentation are an answer, it will show that the portal ergonomics implementation and website design can be also an important way to communicate.

1.   INTRODUCTION

To ensure the peaceful use of the atom, the International Atomic Energy Agency (IAEA) has the duty to verify non-diversion of nuclear materials and the deficit of undeclared nuclear activities [1]. In order to support IAEA mandates, the additional protocol [2] to the French safeguards agreement [3] has entered into force the 30th of April 2004. French additional protocol provides to report for the activities undertaken by a French entity with a NNWS. These declarations concern dual-use goods, research and development activities, and development plans for the nuclear fuel cycle. Since 2016, the implemented system is strengthened by a national law [4] that is applied by virtue of French additional protocol.

In 2003, EURATOM had developed a software application called CAPE (Commission's Additional Protocol Editor) [5]. CAPE was developed in order to allow to all the European Union states to make their additional protocol declaration. At that time, France looked at what could be the benefits of using this software. Results show that, although CAPE software has a number of advantages, this tool partially responded to the French additional protocol. Moreover, as this software is in English, a French translation would have been necessary to be used by French operators. For these reasons, France decided not to use this software application.

From 2004 to 2014, registrants sent paper registrations. IRSN had to re-enter manually all the declarations, analyze and compile them, and make a draft of the French AP declaration. As shown in the table below (Fig. 1), France has an important number of lines, in the range of twice the total lines number of the EURATOM declaration for all the European Union Non-Nuclear Weapon States (EU NNWS). For this reason, the establishment of a web portal free of charge, fully adapted to the French needs and easy to use had proved necessary.

	EU NNWS declaration [6]	FRANCE declaration
2011	330	630
2012	328	658
2013	381	694

FIG. 1. Comparison between lines registered to IAEA since 2011 to 2013 by EURATOM and France

PASTEL has been developed to preserve the French processing steps and improve the AP declaration. As it is presented in Fig. 2, The web portal allows entities to register their activities and these registrations are processed by IRSN to issue the draft of the French declaration, which is then approved by the French authority (CTE).
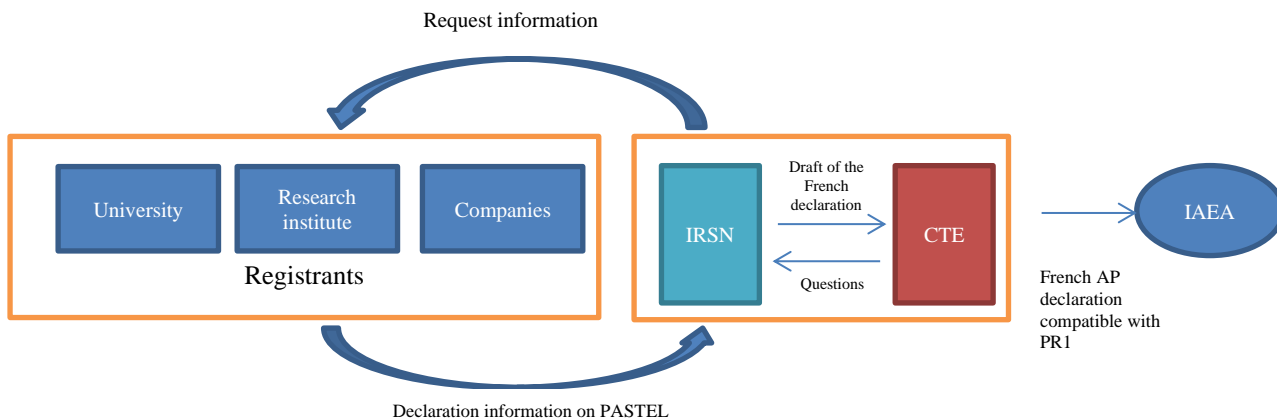

FIG. 2. French strategy to generate AP declaration

In order to improve the implementation of the French AP declaration and facilitate the registration enter for French speakers, IRSN had developed in 2014 a web portal called PASTEL. This choice was led by the aim to facilitate the registration [7] and to take into account some suggestions from the Agency.

In this paper, we present PASTEL and benefits of using it. In section 2, a description of pastel operation is presented. Section 3 outlines the French experience and the lessons learned by the use of PASTEL for three years, the challenges are discussed in section 4. Section 5 summarises the conclusions from this work.

2. PASTEL OPERATIONS

2.1. Web portal

France decided to develop a web portal, easy to use and satisfying the IT security requirements. For the first registration, IRSN contacts the entities and gives to them the web address, their login and password. If users forget their password, they can change it online.

As there is a huge number of users with various activities, the development of a web portal is properly adapted. Indeed, software installation would have been complex.

2.2. Validation rules adjusted to user mode and workflow

IRSN is quality certified according to ISO 9001 [8]: PASTEL portal was developed following the resulting quality requirements. There are three user profiles: Registrant, Administrator and Supervisor (fig.3).

Tab	Registrant	Administrator	Supervisor
Declarations	My report	Entities reports Final reports	Entities reports Final reports
Manage	My addresses My entity My contacts My vacation periods	Address Program Entities Users	Address Program Entities Users
Administer		Opening period Archiving Generating statistics and mailing	Opening period
Handbook	Registrant handbook	Administrator handbook	Supervisor handbook

FIG. 3. List of tab by profile

At each step in the workflow, the declaration may have different statuses. For the user, there are three of them: "in progress", "validated" or "submitted". When the declaration is validated by the registrant, it comes in the administrators workflow with "to validate" status. The administrator can validate, compile or reject the registration line. When administrator validates a registration line, the supervisor can validate or reject the line. The draft of the French AP draft is composed by all the supervisor validated lines.

2.3. Features dedicated to the French reporting method

Registrants have two choices: a negative registration if this entity had no activities to declare regarding the French AP or a positive registration as it is shown below Fig.4.

FIG. 4. Registrant Declaration tab

Although only positive registrations are reported to IAEA, the negative registrations allow IRSN to keep a record of entities which do not have currently AP's activities. Actually, for the reporting period of 2015, 4% of entities had a positive registration while they had a negative registration for the reporting period of 2014.

To decrease the false negative registration risk, IRSN added a questionnaire to check that registrants understood what are the additional protocol objectives and its declarative characteristics. This feature is detailed in the section 3.2.

2.4. Features to facilitate input and simplify update

Registrants can print their declarations into Excel sheet before sending to IRSN. This option answers to the registrant internal audit function needs.

Moreover, for INFCIR/290/add.1 articles 2ai), 2aiii), 2aviii) and 2b) declarations, these form are pre-filled with the previous year data. According to the organizational procedure of each entity, Excel sheet allows the entities with different geographic sites to be more efficient in the declaration update.

After having validated and submitted the lines to IRSN, the registrant can print a PDF declaration. This document summarizes all the lines which are registered by the entity and also all the information as entities contact and entities closed period.

2.5. Address database

There is in PASTEL's address database 1 100 address including French and other countries; both have a dedicated table.

2.5.1. Facilitate input and unique address typography

This database can be used by registrants when they make their declaration. They can add some new partners. The new addresses are verified before being added in the PASTEL address database. As shown in fig.5, each entity must fill out an address book before making their declarations. If the registrant works with a new entity, the registrant adds a new address. After analysis, IRSN validates or corrects address if necessary. This declaration allows using unique address writing and typography.

FIG. 5. Registrant "My addresses" tab- this is an anonymous example

For the French address, there are three types of address:

— "Postal" to which IRSN sends the declaration call every year or quarter. These addresses are unique for each entity and do not require validation by IRSN.

— "Physical" are the addresses where the activities actually took place. There may be several physical addresses for each entity and these addresses are attached to a specific entity;

— "French partners", each entity can add some partners.

2.5.2. Update French entities list

The French entities list was created in 2003 with 4000 shortlisted entities [6] and now has 216 French entities. The nuclear industry and research is changing according to economic, social and political issues. To keep pace with stakeholders, IRSN adds or removes entities to the "French entities list".

Each year, some registrants declare that their activities have changed and they don't want any further contact for that declaration. Their request is analyzed and IRSN validates or not their removal. IRSN keeps a permanent watch on new entities or entities which again have AP's activities. This list is updated thanks to open source, governmental information and entities registration for example. Actually, for 2ai) and 2aviii) declaration, it is required to indicate stakeholders, including French partners. As it was explained above, if an entity address is unknown in the database, user can add it. This new partner will be create and added in the French entity list. The following year, this new declarant will be contacted by IRSN to make his declaration and the program in which it appears will be prefilled. For the reporting period of 2016, 18 new entities were contacted and seven of them were reported by other registrant.

3. THREE YEARS FEEDBACK

The objectives of this study were to estimate benefits of using PASTEL and identify declaration habits to improve AP declaration.

3.1. Saving time and efficiency

Since the PASTEL opening, IRSN estimates having saved nine months full-time equivalent to do this declaration. Indeed, before PASTEL, this role demanded about 180 men-days. Now, the same works need 60 men-days. Data entry labor has been replaced by examination with open source cross matching and the portal continues to be developed (Section 4).

After the 2016 declaration, a survey was conducted among the registrants to get their experience feedback. 20% of the registrants answered our questionnaire. This survey shows that registrants have also a positive feedback from the use of the portal. This study points out an average of 2.4 people by entities that are involved in writing and updating the declaration, with a maximum of six people. 80% of registrants attest that the time needed to formulate a declaration is less than one day.

On the same time, fig.6 shows that there is an increase in the number of lines declared on PASTEL while the number of login decreases. We can notice in 2017 a small rise of registrant login which can be explained by the

increase of the lines registered in PASTEL and the implementation of design which obliges the registrants to update their entities information.

	Lines registered in PASTEL	Registrant login
2015	1195	385
2016	1235	327
2017	1455	344

FIG. 6. *Evolution over three years of the number of lines declared by the registrants on PASTEL website and the number of logins.*

We can conclude that this custom solution allows us to save time both for IRSN and registrants. The automation of data gathering minimizes the risk due to data entry labor and frees up time that we use to do examination with open source cross matching

3.2. Study on the behavior of registrants

For each annual and quarterly reporting campaign, IRSN sets up a hotline and a generic email address allowing registrants to ask their questions. This three-year study is based on the returns of phone calls and mail received on annual reporting campaigns. We found six main behaviours: forgotten passwords, misrepresentations, PASTEL's bugs, wrong people contacted, assistance with AP and the use of PASTEL and typing error of the website (fig.7).
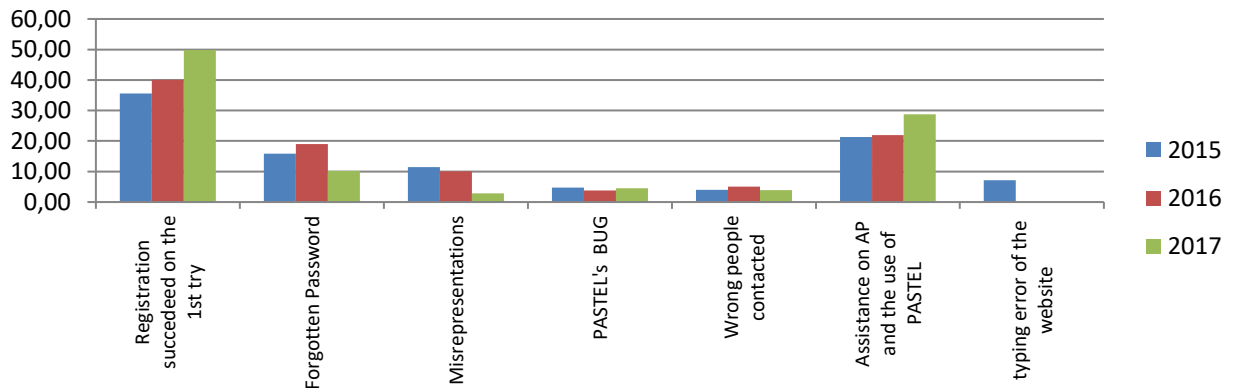

FIG. 7. *Registrant behavioral distribution over three years*

This study shows that the number of registrants who manage to make their declaration on the first try increases. This is explained by the fact that people are getting used to PASTEL and more widely to use computers.

3.2.1. Wrong people contacted and Forgotten Password

Every year, IRSN sends a mail to all entities asking them to declare their AP activities. The coordinates used are those entered in PASTEL. We observed that users did not necessarily update information concerning them, in particular the contacts of their entities and the people in charge of the AP declaration often change. For 4.3% IRSN has a feedback about the wrong people contacted. Consequently, IRSN changed the design to require registrants to update their contacts at each declaration.

For forgotten passwords, we see a sharp decrease between 2016 and 2017 related to the implementation of the automation of password renewal. Indeed, if a registrant forgets his password and his email address is in the database associated with his username, a new password will be communicated to him in his mailbox. His password is modified without contacting IRSN. However, we observe that 10% of registrants always contact IRSN to renew their passwords. The majority of these people are taking over reporting activities and do not appear in the database.

We will see in 2018 declaration campaign if the new design requiring the registrants to update their contacts will allow a decrease of "wrong people contacted" and "forgotten passwords".

3.2.2. Misrepresentations

We noticed in 2015 and 2016 that 10% of registrants were mistaken in their declaration. Some registrants did a positive or out-of-time declaration that they left empty instead of a negative declaration. Other declares a negative instead of a positive.

On one hand, IRSN chose to review the website ergonomic so that the choice between positive and negative declaration is less confusing as shows fig 8.
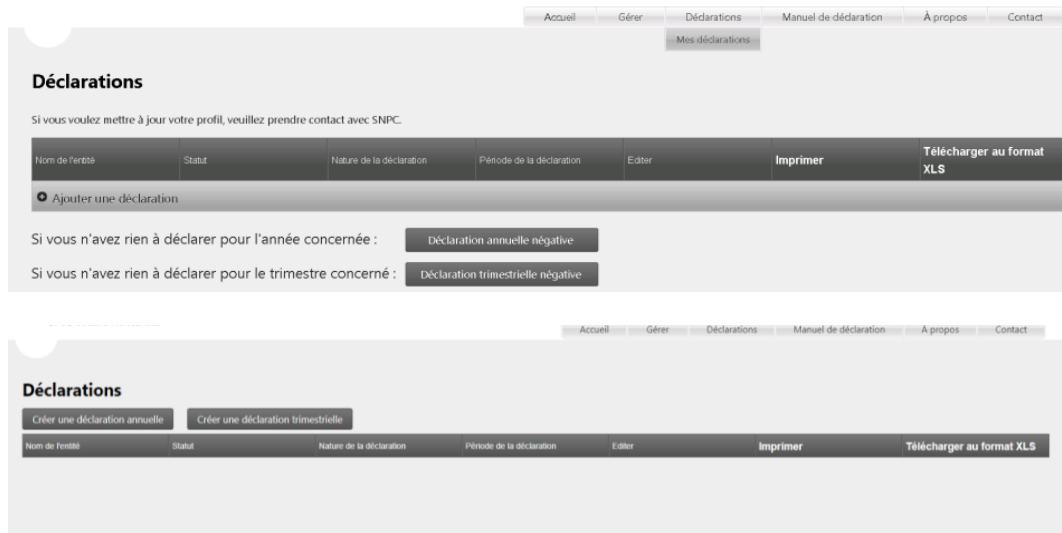

FIG. 8: Comparison of the design of the "Declaration" tab - At the top: the original design; at the bottom: the new design

The first screenshot shows the first design of the website, the second the current design that has been put in place for the 2017 reporting campaign.

On the other hand, to avoid false negatives, IRSN has put in place a questionnaire to ensure that the registrant has no activity covered by the additional protocol. Registrants who did a negative declaration must answer to those boolean questions:
   (a) Do you participate in R&D or training with non-nuclear weapon states (NNWS)?
   (b) Has your research or training been authorized, financed, controlled by the French State or carried out on its behalf?
   (c) Are you planning an R&D program with an NNWS in the next 10 years?
   (d) Do you ship medium or high-level radioactive waste to or from a NNWS?
   (e) Have you manufactured equipment listed in Annex I, in cooperation with an NNWS?

If they answer yes to one of them, there is a message that specifies which declaration they must make. Otherwise, they can print their declaration.

3.2.3. Assistance on AP and use of PASTEL

As seen before, the people in charge of the AP declaration often change and each year IRSN adds new entities. In 2015, we organized four training for entities about AP and use of PASTEL. 80 people attended these training. We have also made available on the portal a registrant handbook to download.

This study shows that few users open the registrants handbook; most of them prefer to contact IRSN directly, especially new entities who do not understand why they are contacted and what activity they must declare, even if it was written in the mail they received. We observe that 24% of registrants call IRSN to have assistance with their declaration.
The implementation of PASTEL to help registrants to write their declaration is one of the challenges described in the section 4.1.

4.   CHALLENGES

4.1. Design and ergonomics improvement

As we saw earlier, a site modification improves the accuracy and efficiency of the answers. In order to continue improving the quality of the French declaration, IRSN is considering design and ergonomics improvement.

On the one hand, we observed that the registrants currently have a rather broad descriptive field that they do not necessarily know how to fill in. With the new form (fig.9), the registrants will be guided and IRSN can get a better idea of the progress of the research program and the involvement of each partner. This new feature will be tested on the 2018 declaration campaign.

FIG. 9. Comparison of ergonomic -, On the left: the current form, on the right: the draft of the future declaration form for the 2ai) declaration

On the other hand, we want to improve the features to help registrants to write their declaration. One of the solutions is to implement an FAQ (frequently asked question tab).

4.2. Setting up an output compatible with PR3

PASTEL generates currently two formats of declarations: a declaration in excel format and a declaration in .txt format compatible with PR1. In order to support IAEA in its mandate, IRSN is evaluating the possibility of making documents compatible with the new version of Protocol Reporter.

5. CONCLUSION

When PASTEL was developed in 2014, the goal was to improve reporting and simplify the declaration process. For this, IRSN has chosen to set up a web portal, the most accessible way to declare. PASTEL has three user profiles which allow the implemetation of a workflow, an address database that is updated and checked each quarter and features that improve the registration.

After three years of use, IRSN observed that PASTEL allows time saving and greater efficiency for both user and administrator. We also notice that:
— there is a high turnover of people who make AP declaration;
— communication through user manuals is not sufficient and reporters prefer direct contact with us;

— Understanding of the additional protocol is not obvious and the registrant's awareness of their duty to report is really necessary.

For that reasons, IRSN decided to improve the ergonomics (ability to respond effectively to the expectations of users with a comfortable navigation) and design (way to easily show the most complex things). These implementations were efficient, and we are confident to continue this momentum. We noted that it was important for a reporting portal to be simple and easy to use, especially to help registrants to understand the purpose of the AP and that they feel concerned by this declaration.

6. REFERENCES

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