Réaction du facteur du Réseau sur la liste [rezo-actu] à l'article ci-dessous :

Et si plus simplement il n'existait aujourd'hui aucune entreprise au monde capable de venir au bout de cette catastrophe comme par exemple de fractionner pour stockage éternel un combustible fondu en magma ?

Un début de réponse ici (*) : pourquoi aucune publicité sur les performances du travail exécuté par le tandem Areva/ Véolia ?

Source : Les Echos

https://www.lesechos.fr/entreprises-secteurs/energie-environnement/actu/0202983628186-pourquoi-le-japon-refuse-de-solliciter-l-expertise-etrangere-sur-fukushima-600606.php

Energie et Environnement

Pourquoi le Japon refuse de solliciter l’expertise étrangère sur Fukushima

Par **Yann Rousseau** | 03/09 | 18:48

Alors que la crise semble s’enliser dans la centrale détruite, Tepco apparaît incapable de maîtriser les travaux. De plus en plus de voix s’élèvent pour dénoncer l’orgueil des groupes japonais impliqués dans le chantier gigantesque et réclamer une plus grande ouverture du pays à l’expertise étrangère.

Le Japon refuse de solliciter l’expertise étrangère sur Fukushima. - AFP

Sur l'ensemble de l'année 2012, 21 appels d'offres avaient été passés au Japon pour des contrats de développement de technologies nécessaires au démantèlement des 4 réacteurs de Fukushima-Daiichi. Mais selon les statistiques de Reuters, aucun des marchés n'a été emporté par une société étrangère. A quoi tient cette situation ? A un mélange de fierté et d'arrogance des responsables japonais. « Il semblerait qu'ils ont envie de gérer cela comme une expérience scientifique et qu'ils veulent donc réinventer la roue », s'était agacé, dès l'an dernier, Jeffrey Merrifield, le vice-président de la division énergie du groupe américain Shaw Group.. De fait, beaucoup d'entreprises nippones espèrent développer une nouvelle expertise en participant au chantier de Fukushima qu'elles pourraient, plus tard, faire valoir sur des marchés étrangers.

Alors que la crise semble s'enliser dans la centrale détruite, il y a plus de deux ans et demi, et que Tepco apparaît incapable de maîtriser les travaux, de plus en plus de voix s'élèvent néanmoins pour dénoncer l'orgueil des groupes japonais impliqués dans le chantier gigantesque et réclamer une plus grande ouverture du pays à l'expertise étrangère. « **Face à la complexité et à l'envergure de cette crise inédite, il faudrait réunir toute l'expertise existante, d'où qu'elle vienne », martèle Mycle Schneider,** un expert indépendant qui plaide, depuis des mois, pour la mise en place d'une « task force » internationale

Frustration des groupes étrangers

Officiellement, des accords de coopération bilatérale ont pourtant été signés avec plusieurs nations, et notamment avec la France, à l'occasion de sommets politiques, mais les groupes occidentaux spécialisés ne sont que rarement sollicités. Tentant toujours d'emporter des contrats auprès de Tepco, d'Hitachi ou de Toshiba qui mènent une grande partie des travaux sur le site ravagé, ces groupes étrangers refusent d'exprimer publiquement leurs frustrations, mais assurent que le démantèlement nécessiterait beaucoup moins de quarante ans s'il était mené avec les meilleurs spécialistes mondiaux du secteur. Depuis que la fuite de 300 tonnes d'eau hautement radioactive a été qualifiée, fin août, d'« incident grave » sur l'échelle internationale des événements nucléaires (Ines) , plusieurs responsables japonais ont tout de même osé prendre la parole pour pousser leurs autorités à se montrer plus ouvertes aux solutions étrangères. Zengo Aizawa, vice-président de Tepco, vient lui-même d'expliquer que son groupe allait solliciter des experts « en dehors du pays » pour faire face aux fuites d'eau contaminée. « Nous avons besoin du soutien du gouvernement japonais mais aussi celui de la communauté internationale », a soufflé le cadre, visiblement inquiet de la récente détérioration de la situation.

______________________(*)___________________________

Source :
https://www.power-eng.com/articles/npi/print/volume-6/issue-2/case-study/veolia-arevas-water-decontamination-system.html

Veolia & Areva's water decontamination system

04/01/2013

A response in record time helps mitigate damage at Fukushima nuclear plant

By Philippe Seberac (Veolia Water),**Ho -Il Bae** (Veolia Water), **Thierry Prévost** (AREVA), **Bertrand Ytournel** (AREVA)

The story of the terrible tragedy that ensued in the aftermath of the earthquake that struck northeastern Japan on March 11, 2011 is well-known. The earthquake, measuring nine on the Richter scale, caused a 14-meter tsunami that devastated coastal towns and villages, leaving thousands dead, injured or missing.

At the Fukushima-Daiichi nuclear power plant, located closest to the earthquake epicenter, the tsunami wreaked havoc, submerging the plant in debris-laden seawater. Emergency power generators were flooded and cooling water inlets were destroyed, causing a failure of the cooling system - a key mechanism for controlling the reactors. With no other means to lower the temperatures, the plant operator, Tokyo Electric Power Company (TEPCO), decided to spray the reactors with seawater and attempt to refill one of the spent fuel rod pools.

To regain control over the situation and eventually enable operations near and inside the reactor building, the accumulating highly radioactive wastewater (~106 Bq/cm^3), needed to be drained and treated as quickly as possible. With limited storage capacity, a solution was sought for the reuse of the treated water in the cooling system.

Proven technologies

Two companies, AREVA and Veolia, responded to the challenge of designing the technical solution to treat the contaminated water at the plant with subsequent reuse to cool the reactors. AREVA used decontaminating processes in France that were suitable for the purpose but the necessary installations lacked sufficiently high flow rates and could not be built within the short deadline. AREVA contacted Veolia Water, a leading water treatment specialist. Veolia had a readily available, complementary technology, the Actiflo™ process, applied at hundreds of sites around the world. An existing Actiflo™ unit at a nearby industrial site was available and could be rapidly dismantled and adapted for quick implementation.

AREVA and Veolia went to work, conducting laboratory and pilot unit tests initially in France and later in Japan and launching a predesign to define treatment principles, equipment availability and feasibility. Within a week, the proposed system for treating the contaminated water was presented to TEPCO who gave the go-ahead to proceed with implementation.

The equipment still needed to be adapted to the volume and nature of the water to be treated, as well as to the exceptional conditions at the damaged nuclear plant. Normally a three-year process to design, build, install and commission the plant, at Fukushima, the teams were given just two and a half months to complete the mission.

A multi-stage treatment process

The AREVA/Veolia solution is at the heart of a comprehensive treatment system implemented at Fukushima that is based on technology developed by several companies. The five-step process selected by TEPCO features physico-chemical treatment and water desalination. The contaminated water is conveyed from the reactor buildings by hose, transiting a complex system of storage structures. Toshiba's oil removal process is applied to the water before it flows through the primary decontamination unit designed by Kurion, a process that had been used following the Three Mile Island nuclear accident. The Kurion technology uses columns of zeolite to reduce the radioactivity by a factor of 100 through retention of cesium-137. This pre-decontaminated water is then treated through an AREVA-Veolia two-stage system that reduces cesium-134 and 137 radioactivity by a factor of 10,000. Strontium 89 and 90 are also reduced significantly by a decontamination factor up to 70. At each stage, more than 30 minutes of contact time with radionuclides adsorbents is needed to enable particles to settle as sludge in the lamella settling devices (Multiflo™ unit and Actiflo™ unit). The principle of lamella settling is to use coagulant and flocculant (+ micro-sand in the case of the Actiflo™ process) to achieve a faster and more efficient settling of particles, concentrated as sludge with a weight concentration up to 80 g/L.

Following the settling process, the decontaminated water, now with almost non-detectable radioactivity levels, is then desalinated by reverse osmosis (Hitachi and Toshiba), with the concentrates further treated through evaporation to reduce their volume (Toshiba and AREVA/Veolia). Part of the treated water is injected in the reactor for cooling purpose, thereby closing the loop.

Accelerated implementation

With the AREVA/Veolia "Actiflo™ Rad" solution defined, the teams turned to the multiple challenges of implementation, first and foremost managing the extremely tight schedule. Working in a non-conventional manner compared with normal nuclear engineering projects, all of the major tasks were launched at the same time, including the contract, procurement, basic design, testing, operating manual and training processes. TEPCO assigned JGC to assemble the plant on site in the "radwaste" building initially used to store low activity waste (in drums).

Coordination of project teams was another significant challenge. Team members from multiple companies, countries and cultures had their own ways of operating and thinking. The damage and turmoil created by the natural disaster also created additional logistical issues for movement of people and equipment. Working in a radioactive environment added further complications and required special training and additional precautions. All assembling operations had to be performed wearing a Tyvek suit to avoid contamination. For welding, a second fireproof suit had to be worn as well as welding gloves on top of the three regulatory gloves required to work in a contaminated environment. In addition, the doorway of an existing building housing the Actiflo™ Rad facility had to be enlarged by cutting through 60-cm thick concrete. Team members also had to contend with cramped spaces in which the equipment was housed and multiple unplanned issues, including the breakage of an overhead crane operating at maximum levels.

At each step of the project, teams accelerated normal operating procedures. A process and flow diagram to calculate flow rates, doses and sludge quantities during the basic design phase was completed in only two weeks. At the Fukushima plant, the nearby Japanese soccer team's training center was converted to a decontamination center and logistics delivery base. The production and assembly process was reduced to only three weeks, thanks to the responsiveness of local teams, especially the JGC Corporation.

Commissioning

TEPCO required Veolia's experts to be present during commissioning and start-up. After a careful safety review with AREVA and a dedicated training by ATOX, a team of Veolia employees, who had volunteered and passed the medical tests, were allowed to work at the Fukushima site. On June 15 and 16, system tests were run to validate the control-command system and an initial trial using water with low level activity proved satisfactory. First results on the very low activity wastewaters (< 300 Bq/cm^3) confirmed that the targeted Cesium decontamination factor (Cs-DF) was achieved (DF > 104). In a combined test with zeolite columns before Actiflo™ Rad, the complete system achieved a Cs-DF > 106. When a trial with highly radioactive water proved conclusive, commissioning took place on June 17 and the system was immediately started up.

The solution, designed to respond to the emergency situation at the Fukushima nuclear plant and support ongoing operations was constructed in record time—two and a half months rather than the usual three years. The Actiflo™ Rad unit reduced the radioactivity of the wastewater by a factor of 10,000, even with significant salt content (seawater diluted twice) at a flow-rate slightly below the design value of 50 m3/hr. The unit operated for three months until another more automated decontamination system could be installed and now remains as a back-up system. Between June and September 2011, the system treated 80,000 cubic meters of water with a radioactivity of 1GBq per kilogram for a total decontamination of 80,000 TBq.

By the end of 2011, Fukushima reactor temperatures were considered by experts to be under control, allowing preparations for the site clean up to go forward.