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ALPHA-CONTAMINATED SOLID WASTE SORTING AND CONDITIONING AT BELGOPROCESS (BELGIUM): LESSONS LEARNED FROM THE FIRST THREE YEARS OPERATION

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ABSTRACT

The alpha-contaminated solid waste generated in Belgium results from past activities in the fuel cycle (R&D + Reprocessing and MOX fabrication pilot plants) and operation of BELGONUCLEAIRE's MOX fuel fabrication plant.

After the main steps in the management of alpha-contaminated solid waste were established, BELGONUCLEAIRE[1], with the support of BELGOPROCESS[2] and ONDRAF/NIRAS[3], started the design and construction of the T & C and interim-storage facilities for this alpha waste.

The accumulated solid alpha radwaste containing a mixture of combustible and non-combustible material must be sorted and characterized. After sorting, both the accumulated and recently-generated alpha waste will be compacted and the pellets will be embedded in a cement matrix in a 400-l drum.

The commissioning of the sorting unit which includes glove boxes was completed at BP, at the beginning of year 2005; the sorting campaign of 30-l cans has been achieved in March 2007.

The paper describes the project environment and gives a short description of the used facilities; the lessons learned from the sorting campaign and from the first T/C period, will be presented, as well.

INTRODUCTION

Origin of the waste

The alpha-contaminated waste (called “A3X” according to the Belgian classification) generated in Belgium results from past activities in the fuel cycle (R & D + Reprocessing and MOX fabrication pilot plants) and present operation of BN's MOX fuel fabrication plant.

1 In short BN
2 In short BP
3 In short O/N

EUROCHEMIC, a pilot reprocessing plant, was operated till 1974 and generated alpha solid waste. The decommissioning program of this plant, which started after its closure, also generated alpha-solid waste.

Research and Development in the fuel cycle and the operation of a MOX fabrication pilot plant erected on the site of the Belgian Research Center (SCK•CEN) have also contributed to the production of alpha-solid waste.

Presently the main producer of alpha waste is BN's MOX plant in operation since 1972 and back fitted in 1985 to increase the capacity to 35 tHM/year.

Form of the waste / Evolution of the packaging

The Pu Contaminated Solid Waste (PCSW) produced by BN is normally generated inside the glove boxes in which it is sorted by category and put into small packets (a few liters) packed in welded double PVC bags.

In the past, the initial small packets obtained were packed in 30-l cans and 220-l drums. The solid suspect alpha waste was placed in the free spaces in those containers. From 1986, the small PVC packets were packed in a 200-l drum without adding any further suspected solid waste.

The produced waste were stored on the BP site in Dessel, waiting for the final treatment and conditioning processes.

Between the beginning of solid alpha waste production (in the 70's) and the end of 1985, the way to packet and to sort by type (burnable or non burnable) at the producer's site has evolved. The specifications, imposed by O/N, have been fixed.

As a result, a significant amount of waste (≈ 231 m^3) generated before the end of 1985 and still stored on the BP site must be re-sorted in order to meet the present specifications:

- the solid suspect alpha waste placed in the free space of the 30-l cans will be removed after inspection of the small welded packets (contaminated alpha waste);
- the small packets in the 30-l cans and the 220-l drum will be sorted into non burnable and burnable waste.

T/C processes/ Evolution of the options

Up to the 90's, the produced waste were stored on the BP site, waiting for a decision about the final T/C options.

At the begin of the 90's , O/N started with the inventory and management of the waste and with the development of a programme for T/C, interim storage of the conditioned waste and their perspectives for final disposal.

For the T/C, the retained solutions to be implemented were

- immobilization for the non burnable waste,
- incineration (pyrolisis) for the burnable ones.

On this basis, it was necessary to re-sort the stored non conditioned waste and, as a result, to build a new sorting installation, called 'A3X sorting installation'; this installation was planned to be commissioned in 2003.

In 2000, the project had to be reoriented once again, due to financial reasons (investment cost for the pyrolisis installation not justifiable with regards to the small quantities of burnable waste, coming from the Belgian program, to be treated). This conclusion was reinforced by the fact that there was no hope to import waste coming from foreign countries.

For the T/C, the final solutions to be implemented for the still stored non conditioned waste were

- sorting and physico-chemical characterization of historical mixed waste, the sorted waste being placed in a 200-l drum (special designed for alpha waste and called ALDRUM),
- volume reduction (compaction) followed by cementation

As a consequence, it was necessary to reorient the 'A3X installation' project; this new sorting installation has been commissioned in April 2005.

DESCRIPTION OF THE PROJECT

The 'A3X' project

The main part of non conditioned alpha-bearing waste produced until 1985 according to the former O/N specifications, is made of 655 220-l drums and 3013 30-l cans which are kept in stock on BP site 1. The "A3X" sorting installation has been set up to ensure the management of those wastes (that is to say approximately 221 m³).

Furthermore, the BN's MOX plant produced from 1985 approximately 20 m³ of non-conditioned waste in 200-l drums each year; it must be noted that a large number of drums will be generated when dismantling the plant later as well. Those waste will be directly treated and conditioned in the refurbished 'Pamela' facility on the BP site.

Originally, the burnable contaminated waste (A31) had been planned to be treated by pyrolisis but, despite the attractive VRF (Volume Reduction Factor), the investment required for a relatively small waste volume was considered excessive and it was decided to treat all alpha-bearing waste by super compaction in the "Pamela" facilities on BP site 1, just like the non burnable waste (A37).

As a result of this reorientation of the project, the "A3X sorting facility" has been designed to meet the following objectives for what concerns the non conditioned alpha-bearing waste stored on the BP site :

- Waste inventory using the waste tracking system of the BP facilities and the transfer sheets filled in the 80's when transporting the alpha-waste from the producer to BP;
- Waste transportation in a sorting glove box (HK) (through the HK1 air lock for the 30-l cans and through the HK3 drum tipper for the 220-l drums) ;
- Separation of the A2X and A3X waste. During the project faze we assumed that the non A3X waste was of the category A2X but we were able to separate this waste as a category with lower alpha contamination limits, namely A1X, see "Separation of non A3X waste";
- Preparation (the burnable wastes in PVC bags and the non burnable ones in 220-l drums) and transportation of the A2X waste for final conditioning in CILVA (facility on the BP site for T/C of LLW);
- Physical and chemical characterization of the A3X waste and transportation in 200-l drum for characterization and measurement of the drum's isotopic content and final conditioning by supercompaction followed by embedding in concrete of the pellets in 400-l-drums in Pamela ;

The waste inventory

The existing amount of waste is known through transportation worksheets from the producer to SCK•CEN until 1980, then to O/N afterwards.

Furthermore, measurement campaigns at random have provided a better knowledge of the packet typical contents. The outcome is the following inventory:

- 3013 30-l cans (90 m³) with an estimated content of 70 m³ of A1X and 30 m³ of A3X, and an average Pu content of 1 gr Pu/can
- 655 220-l drums (131 m³)with an maximum Pu content of 39 gr Pu/drum.

Besides this historical inventory, the production of "new" A3X waste, related to the BN's MOX plant operation from 1985, reaches approximately 20 m³/year of 200-l waste drums, each containing max. 39 gr of Pu, and the waste generation related to the upcoming dismantling of this plant.

Some 250 m³ of non conditioned waste has also been produced by the dismantling activities at the BP sites.

As these "new" wastes have been characterized and sorted at source by BN and the other producers according to O/N specifications, these drums of new waste will directly be supercompacted in Pamela, without any pretreatement in the A3X sorting facilities.

Figure 1 illustrates the waste streams.

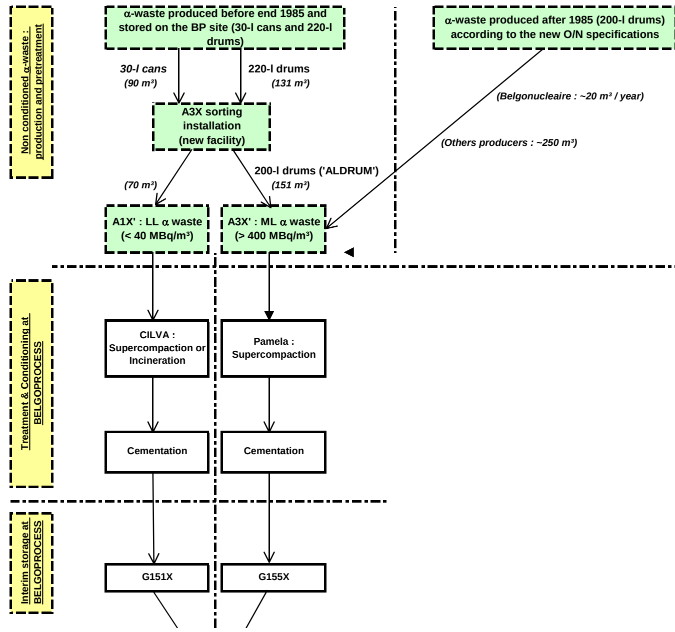

Figure 1: Waste streams

DESCRIPTION OF THE PRETREATMENT FACILITY

The 'A3X' sorting facility

The A3X sorting facility includes four main glove boxes linked to each other by tunnels.

This facility is located in room 102 of building 110 on BP site 1.

The main features of these glove boxes (HK) are:

- HK1 : transfer of the 30-l cans through an air lock ; this transfer is followed by the sorting of the A1X and A3X after non-contamination control of the primary packets;
- HK2 : transfer of the A1X in a 220-l drum (non burnable waste) docked by a airtight system and compaction of the emptied cans; the burnable wastes are evacuated in PVC bags ;
- HK3 : docking transfer and airtight tipping of the 220-l drums of A3X waste ;
- $HK3_{bis}$: the sorting program which started in April 2005 applies only to 30-l cans during the first two years. Therefore, it has been decided to carry out a small HK3 bis transportation compartment allowing the transfer of A3X waste from HK1 to HK6 without any contamination risk of the residual HK3 ;
- Tunnel from HK3 lies to HK6 : metal detection ;

- HK6 : weighing, physical and chemical characterization of the A3X waste ; separated transfer of A31 and A34 waste in 2 200-l ALDRUM drums docked by a device with weldable shell.

A series of growing depressions ("cascade") from HK2 and the HK1 air lock to HK6 is ensured by the ventilation.

The transfer between glove boxes, the compaction, the tipping of the A3X 220-l drum and the docking of the A1X drum are managed by PLC and with two OP37 switchboards located on HK2 and HK3.

Figure 2 illustrates the sorting facility.

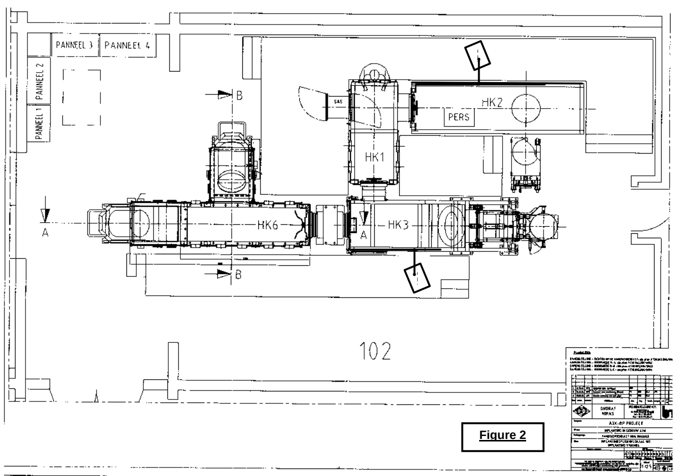

Figure 2: Sorting facility

The sorting scenario for the 30-l cans

The 30-l cans stored in building 110 are put in a 1 m³ container (each containing 20 cans) which is transferred to the sorting room. Each can is weighed when unloading the container in the sorting room.

The can is put into the HK1 air lock. Then, it is transferred to HK1 and opened. The A3X waste contained in that can are normally covered by a double plastic envelope with intermediate protection by bubble plastic for scrap metal.

Before being closed, these 30-l cans have been filled up with A1X secondary waste, in order to optimise the filling rate. Therefore, as soon as the can is opened, a smear test is carried out on the primary packaging and on the inside of the can in order to verify the non alpha contamination. This smear test is controlled outside the HK1 glove box using the classical 'BAGin-BAGout' technique. (If there is a contamination, the can is closed with its content and directly transferred in the A34 ALDRUM drum to HK6. Decontamination of HK1 is carried out if necessary).

The A3X wastes are transferred into HK3bis.

The primary A3X waste packets are transferred one by one to HK6 through the HK3-HK6 tunnel, surrounded by a metal detector which detects the presence of metal with a sensitivity of approximately 10 g.

In HK6, the A3X packets are weighed, characterized chemically and physically by visual inspection, then set into the A31 ALDRUM for the burnable and into the A34 ALDRUM for the non burnable.

When one of the ALDRUM is full, it is docked away, its shell is welded and its cover is hooped. The drum is then placed in an interim storage room before being processed by supercompaction in the Pamela facility.

The A1X waste is treated as follows:

- the non burnable wastes (A17) and the emptied cans are transferred into HK2, where they are put into the 220-l drum (after compaction of the 30-l can). When a A1X 220-l drum is full, its cover is reset via the airtight docking system and, after a control procedure, the drum is evacuated in order to be processed by supercompaction and embedding in concrete of the pellets in a 400-l drum in the CILVA facilities;
- the burnable wastes (A11) are transferred to HK2, evacuated through plastic bags and transferred for incineration to the CILVA facilities.

Figure 3 is a photo of the sorting facility, view at HK6.

Figure 3: view at HK6

The sorting scenario for the 220-l drums

The 220-l drums will be treated once the sorting campaign of the 30-l cans has been completely achieved.

The reference design scenario was the following :

- the sorting scenario of the 220-l drums is similar to that of the 30-l cans. It will imply the later disassembly of the HK3bis compartment before the start of the campaign.
- a 220 l-drum is put on the HK3 drum tipper and its cover strapping is withdrawn.
- the drum is tipped by 135° and docked on the cover airtight gripper system which, when it is swivelled, allows the discharge of the drum content into HK3. After an alpha non-contamination control, the empty drum is docked away, reclosed and sent for supercompaction in CILVA.
- afterwards, the wastes are transferred to HK1, where the control and sorting process is identical as that of the 30-l cans.

Nowadays, an alternative solution is envisaged, namely :

- no pre-treatment, no sorting
- direct transfer to the PAMELA facility for treatment and conditioning as described here under.

The final decision depends, things among others, on economical aspects.

DESCRIPTION OF THE PAMELA CONDITIONING FACILITY AND OF THE INTERIM STORAGE FACILITY

PAMELA is a former vitrification facility for high active liquid waste resulting from the reprocessing plant EUROCHEMIC; it is made of shielded cells which BP has reconverted in order to carry out the treatment and the conditioning of waste (e.g. medium active ‘historic waste’, A3X, alpha contaminated glove boxes,…). This installation is presently being adapted.

The 200-l ALDRUM from the A3X sorting facility and those produced after 1985 will be directly introduced in the PAMELA cells through a ventilated air lock. Then, they will be supercompacted and the resulting pellets will be piled up in a 400-l drum where they will be embedded in cement. The full 400-l drums are then docked away by a double lid system and closed. Control of both the radiation/contamination level is carried out.

Afterwards, the controlled drums are transferred to the interim storage building B155 on BP site 1.

The 400-l drums will be stored in this building until the final disposal facility (geological option) will be available in Belgium.

EXPERIENCE OF 3 YEARS OPERATION / LESSONS LEARNED

Learning the tricks of the trade

Prior to the commissioning 5 BP employees went true a training period of six weeks at the BN MOX plant. There they could practice and refresh the specific craftsmanship and experience needed to work with highly alpha contaminated materials in glove boxes.

During this training period BP also got acquainted with the physical nature of the A3X waste produced by BN, this information was of great help when making a detailed description of the waste. To profit from the BN expertise, BP hired 3 operators, who worked in the BN waste department, for the time the A3X sorting facility would be in service.

Avoiding contamination of HK1

Before the actual sorting of the waste, we still had one big unknown. What was the state of the waste packets inside the cans after more than 15 and 20 years? The last time a small number of cans had been opened and inspected was 1997. The result of this inspection was that some cans were internally contaminated. What would be the state of the packets after another 8 years?

Before 1990 Belgonucleaire welded A3X waste in one single PVC-bag, after 1990 they placed the packets in a second PVC-bag. The majority of the cans dated from the period before 1990, so the risk that the one PVC bag was damaged during handling of the cans, or degraded, was real. If a damaged bag would spill its content into HK1, we would have to totally decontaminate this glove box. And afterwards we hope we could reach a level of surface contamination sufficiently low enough to still be able to make the separation between non A3X waste and A3X waste.

Another unknown factor was the way the producers other than BN had packed there A3X waste, was it the same as BN did? Were non protected pointy or sharp edged pieces of waste, which easily could have damaged the PVC bag, packed in the proper manor?

Therefore the first 18 cans have been processed using a special plastic bag equipped with sleeves which served as gloves. The bag allowed an evaluation of the cans inner contamination. Among the first 18 cans, one has been found slightly contaminated. It was never foreseen to use this special plastic bag for more then 20 cans because the bag was secondary waste and the use of this bag was labour intensive, very inconvenient for the operator and time consuming.

In the case of a contaminated can, we discovered that this contamination often occurred at the bottom of the can, where the PVC bag was trapped between the bottom and a relative heavy piece of waste.

Due to degradation, the PVC bag did not get brittle, but it sometimes turned out to be black and/or sticky. When a sticky bag stuck to the bottom, great care was taken whilst pulling it free. Because by doing so it could provoke a release of contamination in HK1. So we developed a way of opening the can step by step;

- Lift the lit slowly, take a smear test of its inside face, close it and check for alpha contamination
- Fully open the can and check the top of the waste for contamination

- Slowly take out the waste, put it into a thin polyethylene bag continuously checking for contamination during the emptying of the can
- While's doing this separate the loose non A3X waste from the A3X waste sealed inside PVC bags
- Thoroughly wipe the whole inside of the empty can and check for contamination
- Evacuate the A3X waste first from HK1 to HK3

The smear test can be measured directly inside HK1 or it is brought outside using the classical 'BAGin-BAGout' technique and then determine the Am^{241} activity by means of gamma spectrometry. When an alpha contamination was constatated we put the waste back into the can. The entire can plus content would be considered as A3X. Now the risk of contaminating this first glove box is gone.

This manner of conduct we learned the hard way, in the beginning we would sometimes go forward with emptying the can, only to discover that between the waste packets and near the bottom there was a lot more contamination present. This resulted in a contamination of HK1, which sometimes took days to clean before we could reach a level of isolated spots with fixed contamination of a few Bq.

The can opening procedure and the strive for a policy of "zero tolerance" with respect to contamination within this glove box, was the main key to the success of separating the A3X waste from the non A3X waste. It also guaranteed the further save use of the airlock which had the advantage of a quick transfer of cans into HK1.

With all of these precautions from time to time HK1 got contaminated. We separated HK1 into 2 parts using clear PVC foil as a screen with a slit, so cans could pass back and forth. This meant that the first part of HK1, near the airlock, only very rarely got slightly contaminated. The bottom of the second part was covered with a disposable PE sheet, thus making decontamination of HK1 less difficult.

Separation of non A3X waste

As mentioned above, when an alpha contamination was constatated the entire can plus content would be considered as A3X. We apply a limit of 100 Bq on a smear test taken over a surface of +/- 15 dm², because, when a A3X packet would be damaged there will be in any event have a high contamination inside the can.

By doing it so strict we can be sure that, later in CILVA, A11 waste can be incinerated which is more cost affective then super compaction and super compaction of A2X is still about 5 times less expensive than super compaction of A3X. Therefore we make a separation between A1X (not A2X) and A3X waste.

When we ever would arrive at a level of contamination in HK1, that all waste coming out of HK1, even after thorough cleaning, would pick up this much alpha activity so that we only would be able to make a separation between A2X and A3X waste. The airlock of HK1 would be replaced by a large ring to 'BAGin' the cans.

When levels of contamination in HK1 would be so high that everything going into HK1 automatically would come out as A3X. We would stop separating initial non A3X from A3X waste. Cleaning takes time and will also produce waste, and thus a cost. When cleaning should cost more than we can recuperate from a separation. In these 2 cases all still to be treated waste, would be considered as A3X.

Maximum alpha activity limit (Bq/m³) Applicable at the CILVA facility		
Waste category	**combustion**	**super compactation**
A11 combustible	40 MBq/m³	not applicable
A17 non combustible	not applicable	40 MBq/m³
A21 combustable	not applicable	400 MBq/m³
A27 non combustable density < 0.3	not applicable	1 GBq/m³
A27 non combustable density > 0.3 < 0.6	not applicable	2 GBq/m³
A27 non combustable density > 0.6	not applicable	4 GBq/m³

Corroded cans

Manny 30-l cans were corroded, varying from small rust spots over the inside of the can that was totally affected by corrosion, which left the waste and bottom covered in a relative thick layer of dust, to cans with holes up to several centimetres in diameter. Cans with externally visible faults were already put into a plastic bag before shipment to the sorting facility.

Figure 4 shows the inside of a 30-l can with rust covered waste packets

Figure 4: rust in 30-l can

The powdery rust was problematic, as it spread over HK1 and HK2. The position of the ventilation inlets was adapted, the point of extraction was brought down to the vicinity of the bottom of the glove box. This meant not only a smaller dispersion of rust but also of contamination in HK1.

The cans stood on shelves in a storage room. When cans had to be conveyed, handling cans with small defects never before detected, were responsible for several local contaminations in the storage room. As a precaution measure prior to transport all cans were put in to plastic bags.

Somme cans still were in perfect condition. We only could find that the reason for this was the difference in the type of 30-l can used by our clients over the years. Because no data of the materials used to make these cans were at our disposal, we were unable to give an exact reason why they did not corrode.

Degradation of the PVC bag

As we said before some packets had primary PVC bags that got sticky and or turned black. Making the waste inside totally invisible. Some bags also were less flexible.

We only found 2 inflated PVC bags. As it turned out, the majority of the bags were under negative pressure.

About 5% of the cans had damaged bags inside, which led to an inside contamination high enough to consider the whole can as A3X waste.

Radiolysis of PVC forms hydrochloric acid, this could explain the fact that corrosion developed from within the cans. We had the impressions that cans were more corroded if they had packets containing MOX-powder in direct contact with allot of PVC .

Controlling contamination in the glove boxes

Not opening the primary packets and not reopening an as A3X considered can, was a measure taken to prevent extensive contamination of HK6. This contamination could migrate as far back as HK1 and jeopardise the separation of A1X from A3X waste.

After a contamination in the glove boxes HK1, HK3 and HK6 sometimes spots with > 50 kBq/cm² were found.

Cleaning and decontamination was done with Extran® MA 01 detergent, a household window cleaning product and abrasive liquid.

Regular cleaning of all the glove boxes kept contamination well under control.

Glove box	After several times of thorough cleaning: Spot of maximum residual contamination (Bq/cm²) found in the glove boxes today
HK1	50
HK2	0
HK3	800
HK6	600

In the airlock and HK2 we, thus far, never found any contamination mostly due to the ventilation, the extra compartmentation of HK1 and the strict rules for the separation of A1X from A3X .

Difficulties encountered during sorting and identifying waste

Somme cans contained liquid, the liquid then was poured out onto thick tissues, absorbed and left to dry completely.

A1X waste often consisted of a pile of rubble inside the can. This rubble was in general made up of burnable materials like paper, plastics, chirurgical gloves etc., but occasionally it contained sharp loose glass fragments and larger pieces of glass. The glass had to be picked out one by one and very carefully with tweezers. To our dismay, a few cans contained A1X with injection needles in between the rubble, some even without a cap. So extra care was taken when inspecting A1X waste.

In case of a totally rust covered or blackened A3X packet, we could determine the physical nature of the waste inside based on; touch, its weight to volume ratio and its outline. These observation supported by our knowledge of the waste gave us a sufficiently good idea what was inside the bag. If A3X waste like glass or small metal parts were put in a small container we would rattle it and listen to what was inside.

Because of the transport belts weight limit (in the tunnel between HK3 and HK6) cans in excess of 20 kg did not go into the sorting facility. Such cans were put directly into a 200-l drum, 2 or 3 cans could fit in one 200-l drum.

Radiation dose

During the transfer of the cans into the airlock, the operator wears a lead apron and gloves to protect him from the gamma radiation of Am^{241}.

Inside the glove boxes operators didn't use lead gloves because this was unpractical and inconvenient to work with, instead they had used a pincer grip to handle packets with higher dose rate.

During the first 2 years of operation of the A3X sorting installation, 6 operators received a total whole body dose of 18.3 man-mSv, for the hands the total dose was 62.1 man-mSv.

About 30% of the cans had contact dose rates in excess of 2 mSv, even up to a maximum of 19 mSv. The average dose rate per can was 0.75 mSv.

Aldrum system

The aldrum system performed very well.

After assembly of the aldrum 200-l drum we performed a leakage test on each drum. A drum was dismissed when after 1 hour the negative pressure inside the drum rose from – 1000 Pa to les then –300 Pa. When a drum failed this test we reassembled the drum and did the test again.

Changing a drum takes 3 trained operators between 15 to 25 minutes. When changing a drum we never encountered a contamination. An optimal filling of these drums was achieved with the help of an extended pincer grip.

Output information

In the late 90's an estimation of the composition of the A3X waste and its cellulose content was made. This estimation was relying on the quantity of cellulose that went into the controlled area of a nuclear facility were A3X was produced like BN.

During the sorting of the waste it turned out that the cellulose content was overestimated by 3 times. Because most of the cellulose brought into the controlled area went to A1X and A2X types of waste, instead of the A3X waste.

For the final geological disposal in the so called Boom clay formation of the A3X waste, it is necessary to know the physical nature of the waste and its cellulose content (paper, tissues, wood, coton, cardboard etc.).

In Belgium there is a limit of maximum 100 kg cellulose per conditioned waste unit, which is a 400-l drum. This cellulose limit ensures that cellulose degradation products, such as isosaccharinic acid, have no effect on the sorption of long lived isotopes like Pu and Am in Boom clay.

Prior to commissioning, we sorted 19 cans filled with simulated A3X and A1X waste in them. This we did to see if we would be able to identify and describe the waste inside without opening the packets. When we compared the result of this test with the actual composition of the 30-l cans content, it showed us that we could make a good physical characterisation of the waste, and sort it in burnable and non burnable waste. For the cellulose content we always made sure that we did not make an underestimation.

We now have a much better description of the overall composition of A3X waste from the main A3X producing company's in Belgium other then BP. Our own records contain sufficient information to describe the physical nature of our A3X waste, mainly from the dismantling of the old Eurochemic plant.

This information helps to make up a so called physical vector of the waste. It gives us, per combination of producer and waste category, a list of all occurring types of material and for each type its proportional share.

The physical vector of BN A3X waste and its cellulose content is now used to determine the average composition of BN A3X waste in 200-l drums which are processed at the Pamela facility without opening them and therefore without inspecting its content.

Production results

Over a 2 year period, from April 2005 until March 2007, 3001 cans were treated at the sorting facility.

Quantity of waste before sorting		
Processing period	**Number of 30-l cans**	**m^3**
April - December 2005	873	26.2
January - December 2006	1746	52.4
January – March 2007	382	11.5
Origin of the waste	**Number of 30-l cans**	**m^3**
BN	2574	77.2
SCK	262	7.9
EUROCHEMIC	130	3.9
IRMM	35	1.1
Total	*3001*	*90.0*

Quantity of waste after sorting		
Waste category	**Number of 200-l drums**	**m^3**
A31	140	28
A37	156	31.2
Total A3X	*296*	*59.2*
A11	44	8.8
A11 secundary	8	1.6
Total A11	*52*	*10.4*
A17	101	20.2
Total A1X	*153*	*30.6*
Total directly originating from the A3X waste	*441*	*88.2*
Overall Total	*449*	*89.8*

After sorting in the A3X installation the total waste volume stayed the same but 1/3 of it has been sorted out as A1X waste.

The difference in cost between A3X, for the final storage, is over 6 times more expensive as A1X waste. This difference and the quantity of A1X recovered, makes the effort to sort A3X waste packed in 30-l cans worthwhile. It not only gave us a much better knowledge about the composition of A3X waste but we also saved more then 20% on the overall treatment and conditioning cost for this type of A3X waste.

