

**WEST CUMBRIA SITES STAKEHOLDER GROUP
ENVIRONMENTAL HEALTH SUB-COMMITTEE**

**MEETING 64 OF THE EHSC
HELD AT CLEATOR MOOR CIVIC HALL
ON 24th November 2005.**

Present:

Prof. J Haywood (Chairman)	Radiation Protection Advisor, N.Cumbria Health Authority
Mr R Hargreaves	Six Parish Councils
Rev J Hetherington	Cumbria County Council
Dr M Emptage	EA
Mr T Parker	BNGSL
Mr W Harvey	Six Parish Councils
Mr V Emmerson	Copeland Borough Council
Prof. S Jones	Westlakes
Dr Nigel Calvert	Health Protection Agency, Cumbria and Lancashire Unit
Mrs L Sherwen	NFU
Mr Rob Allott	EA
Mr David Webbe-Wood	FSA
Mr Bill Camplin	CEFAS
Ms S Allen (Secretary)	BNGSL

Apologies:

Dr J Vickers	Cumbria Primary Care Trust
Mr N Hobson	NII
Cllr T Johnston	Copeland Borough Council
Dr Frank Atherton	Director of Public Health, Morecambe Bay Primary CareTrust

Public and Press

Ms J Allis-Smith	CORE
Mrs M Higham	Drigg
Mr Norman McPhail	Emergency Planning Sub-Committee
Mr David Cook	Emergency Planning Sub-Committee
Ms Karen Wilson	Emergency Planning Sub-Committee

AGENDA ITEM 1. Chairman's introduction

- 1 The Chairman welcomed attendees, and welcomed new members to the EHSC. Mrs Liz Sherwen representing the NFU who was attending this meeting, also Mr David Davies (CBC) and Mr S Moffatt and Mrs McCarron-Holmes (ABC) who were unable to attend the meeting.
Mr Rob Allott (EA), Mr Bill Camplin (CEFAS) and Mr David Webbe-Wood (FSA), presenting the information from the joint RIFE-10 report were also welcomed.

AGENDA ITEM 2 – Minutes of Meeting 63.

2.1. Amendments to the minutes.

- 2 No amendments being requested, the minutes of the previous meeting were approved for issue.

2.2. Matters arising.

- 3 Ms Allis-Smith asked if, with regard to the CRR report, BNG could produce a report on how much CO₂ was produced throughout the cycle. Mr Parker responded that as the company was now spilt up, looking at CO₂ for the whole nuclear cycle was beyond the remit of Sellafield. He will take the question away and see if a response can be produced. Mr Hargreaves commented that the government was going to look into this matter – it was not something the EHSC should get involved with. Professor Haywood

said it was a broad environmental issue and should perhaps be referred to the main group. Mr Hetherington suggested this should be a joint fact finding issue and in a wider context (re the debate on nuclear build), something the NDA should be looking at. This was clearly an area of major public interest and the new stakeholder group should look at it. Professor Haywood thought there were likely to be answers to this question over the next 12 months – depending on who is providing them (nuclear build/operators perspective). Professor Jones asked who the question should be addressed to – BNGSL was a Site Licence Company answering to the NDA, the NDA were into decommissioning and not into new build – so who should respond to such a question?

AGENDA ITEM 3. RIFE-10 Report

Terrestrial Monitoring – presented by Mr Webbe-Wood (FSA).

- 4 Mr Webbe-Wood said the FSA was set up in 2000, so had been operating for 5 years. It monitors food, making an assessment of the impact of discharges on public health. Approximately 5500 samples are taken and 6500 analyses done, from around nuclear site, on fish and seafood, and milk from local farms on a weekly basis. Distant sites are also sampled, and general diet surveys done.
- 5 The dose to the public is calculated from the level of radioactivity in food x amount of food eaten x dose coefficient, and compared to doses from natural radiation. The annual limit is 1000 μ Sv/yr from artificial sources of radioactivity(excluding medical sources).
- 6 The terrestrial dose, to those eating local vegetables and milk is 36 μ Sv/yr and the aquatic dose to those eating local seafood is 220 μ Sv/yr. These are broadly comparable to last year. In comparison, a London to Sydney flight gives 160 μ Sv/yr and the annual UK dose from natural sources is 2200 μ Sv/yr.
- 7 The provisional results are available on the FSA web-site, published quarterly on www.food.gov.uk.

Marine monitoring – presented by Mr W Camplin (CEFAS).

- 8 To explain what CEFAS (Centre for the Environment, Fisheries and Aquacultural Science) covers, Mr Camplin showed a map of Cumbria, showing areas where they classify the e-coli content of shellfish from sewage going into the sea, indicating whether it is fit to be marketed. The area nearest to the site is a Class B – shellfish can't be put directly onto the market, unless treated beforehand or moved to a clean area.
- 9 He explained that CEFAS carry out fish egg surveys, there are not enough fish in the Irish Sea. They collect fish eggs and study fish stocks in the sea, looking at control of fish stock and the effects of climate change.
- 10 CEFAS covers coastal zone management – wind-farm licences, aggregate dredging areas, oil/gas fields, all have CEFAS involvement. Dredging rules exist about dumping waste from dredging, especially if there is radioactivity in it. A *de minimus* dose of 10 μ Sv is allowed – they had done research to show no impact from dredging from Whitehaven Harbour.
- 11 CEFAS studied Tc99 from the seabed, samples had been taken and showed Tc99 penetration into the seabed - this will be released from the seabed and get into foodstuffs over the years.
- 12 CEFAS designs and operates the marine programme, collates data, run models, assesses doses and publishes and distributes the RIFE reports.
- 13 Mr Camplin reported that for the habit surveys, some 500 observations were taken in 2004, showing no change in consumption pattern. The area covered is Solway to Barrow, with local concentrated sampling around Sellafield and Ravenglass.
- 14 Beta/gamma in fish, from tritium and C14 is from site and natural sources. C14 has increased slightly from Magnox reprocessing, Cs137 is broadly the same. Beta/gamma in shellfish, from tritium, C14 and Tc99. Tc99 up to 10,000Bq/kg in lobsters. Tc99 is down compared to 2003. Transuranic nuclides, highest concentration about 10Bq/kg, broadly similar to 2003.
- 15 Mr Camplin commented on the CODEX limits. This is an international body, linked to the UN, proposing limits on radionuclides allowed in food. Under these, the Solway

- fishing area would have been over the Pu limit. The limits had been rethought and a new draft was due in April 2006. The scope of the regulation has changed – only triggered in the event of an accident.
- 16 Taking a longer view, Mr Camplin advised that C14 had increased slightly recently, but was a small contribution to total dose. Tc99 had reduced to lower levels in 2004 due to the new TPP process. Cs137 had fallen over a 15 year period, but there may be a small increase occurring, probably due to a redistribution of sediments in the North Sea. Of the total dose to the critical group in the Sellafield area, a third was due to old Sellafield discharges and two-thirds due to Marchon old discharges. Transuranic radioisotopes are responsible for the dose.
- 17 The monitoring programme extends round the North Sea – Ireland, Dumfries & Galloway and North Wales. Doses were highest round Sellafield, and there had been an increase over the last 5 years – but this was due to increases in consumption.
Environmental Monitoring – presented by Dr Rob Allott (EA)
- 18 The EA cover effluent and environmental monitoring, and solid waste quality checking. On 1 October 2004, a new Authorisation came into force. The measurement comparisons were against the old limits, as these were in operation for most of the period. The new limits were reduced for many radionuclides. The Authorisation for the Low Level Waste Repository (LLWR) at Drigg, was currently under consideration.
- 19 For all radionuclides, liquid discharges were less than 78% of the limits and gaseous discharges were less than 26% of the limits. Drigg recorded less than 1% for liquid, and LLW was less than 37% of the limits.
- 20 Liquid, aerial and solid waste sampling is done by contractors on behalf of the EA. Some samples are taken in the presence of a witness.
- 21 For liquid, they analyse a duplicate sample and compare to BNGSL results. 570 comparisons were done. Different analysis techniques are used to BNGSL. The EA compare the contractor and BNGSL analysis results and comparisons are classed as 'good' if the results agree within their 95% confidence limits or if the difference in the results is within 30% of their average. There had been a decrease in good comparison results, this had prompted a review of techniques, with analysts comparing methods to improve results. Often the contracting laboratory has to improve/alter their techniques to better align with the experience of the BNGSL chemists.
- 22 Gaseous results had shown a drop off in good results. The Thorp DOG stream was introduced and causing problems with getting good agreement. BNGSL was producing higher results. LLWR results were OK. For SETP, BNGSL results were generally higher than the EA.
- 23 The Waste Quality Checking Laboratory at Winfrith, Dorset checked an iso-freight received at the LLWR of 70x200 litre drums from Bradwell, against the declaration of disposal, using a variety of techniques. The facility is newly commissioned, the site operators are aware of it and that waste may be checked. The lab found aerosols, which are not allowed; C14 was under declared; gamma emitting radionuclides were over declared. The consignment was sent back to Bradwell.
- 24 The EA monitoring also looks at radionuclides in sand, sediment and seaweed, and gullypots in Seascale and Whitehaven. The average background doses from silts was 0.07µGy/yr, the highest local dose was 019µGy/yr (a slight reduction from 2003). A reduction from 0.29µGy/yr to 0.13µGy/yr was found for the River Calder following the closure of Calder Hall.
- 25 The dose rate has fallen over the last few years, 2003 and 2004 were identical. The average concentration was lower in 2004 than in previous years. There was a slight increase in Cs137 in silts from local areas – from historical activity in sediments recycling. Co60 followed discharges, so an upturn was likely to show in the 2005 results. Tc99 in lobster and shellfish had dropped off.
- 26 Tritium was monitored in surface water, in the Drigg stream, the rail stream, at the Ehen spit and Wastwater. Wastwater was at limit of detection. The railtrack drain had decreased and the Drigg stream was down. There had been an increase in tritium

- concentrations at Ehen spit in 2003, which could be due to a decrease in ground water/rainfall. These concentrations had levelled off in 2004.
- 27 Gullypot monitoring stemmed from a historical contamination problem with pigeons in Seascale, and wash out from the garden concerned. A trivial concentration was now being seen – similar to other drains in Seascale – checks were ongoing.
- 28 Doses to various people were similar to last year, very low compared to the 1000 μ Sv/yr dose limit to the public. The increases were due to changes in habits.
- 29 The total dose from Sellafield for seafood consumers was 220 μ Sv/yr (210 μ Sv/yr in 2003). The total dose including historical discharges from Rhodia Consumer Specialities Ltd, was 600 μ Sv/yr (700 μ Sv/yr in 2003). A new method of calculation was in use, looking at one year only, not 5 years as previously. The total dose was less than the annual dose limit. Environmental concentrations were similar to the previous year.
- 30 Dr Emptage made an observation, that the C14 increase in discharges, was due to increased Magnox throughput and because BNGSL, as part of environmental improvements had installed the C14 scrubber, which routed C14 from aerial to liquid discharges.
- 31 Mr Hargreaves commented that in the last 3 years, work had been published on radioactivity in bottled drinking water. Mr Webbe-Wood said this was referenced in the report, but not included in the dose. Most water was taken for the tap. If a lot of the higher activity bottled water was drunk, a higher dose would be measured.
- 32 Mrs Sherwen asked about the sampling area - this was mostly round the coast, why were there not more samples taken inland? Mr Webbe-Wood replied that the sampling was concentrated on farms round the site, there were few milk farms up in the fells. He will raise this with the designers of the programme. Mr Parker commented that there used to be inner and outer farms, the inner farms had higher doses, so these were more important.
- 33 Ms Allis-Smith asked if the CODEX limit was 1 Bq/kg Pu and about getting a copy of the UK responses to the consultation. She considered that this limit only applying when there had been an accident was totally unacceptable when levels were at this limit now. Mr Webbe-Wood explained that the CODEX dose calculations were different to those used in the UK, the CODEX calculations were theoretical. Mr Camplin said the CODEX was trying to introduce a system that would be triggered instantly in the event of an accident, there was a lot of pessimism inbuilt. CEFAS etc can do a proper assessment because of previous work, so different limits are more sensible.
- 34 Professor Haywood asked if CODEX limits only applied to artificial radionuclides, this was confirmed. He suggested that decisions were not reached on scientific grounds, this was a political body so the response would be an agreed negotiated arrangement between parties with different interests – a political rather than scientific result. Mr Allott said the EA had to ban a lot of shellfish consumption because of high polonium content. For grouped nuclides, they talked of the worst case with the highest consumption rate and so ended up with a cautious number for any group, plus some inbuilt caution. This was being reconsidered. The EA supports the standards, but they should have been well founded.
- 35 Mrs Higham asked how long it would take to detect an accident, what was classed as an accident, how long would it take to analyse? Professor Haywood advised that an accident was something preventing you predicting dose. There was a great opportunity for states to interfere with trade to further their own interests. Professor Haywood recalled that after Chernobyl a very low import threshold had been imposed and within days it had been found to be so low that it was preventing trade between states. It was better to have decided beforehand on levels, so this sort of arbitrary action doesn't need to be taken.
- 36 Mrs Higham pointed out that the EA doses shown were for external doses, if food consumption was being discussed – that causes different affects, different damage. Professor Haywood said at the stakeholder group meetings, he often referred to the natural K40 in the human body. Mrs Higham said the problem was the effects of

different radionuclides in the body, and of different accumulations – some were retained and some excreted. Professor Haywood said there was a reference work, that for each radionuclide no matter what quantity and how in-taken (inhaled or ingested), tells what the effects are and takes account of the residence time in the body. Professor Jones said the dose quoted is that you would get this year and for the next 50 years - all factors are taken into account into the dose co-efficient. Mr Parker commented that external and internal exposure from natural and artificial should perhaps be compared – he would look at that for the future.

37 Ms Allis-Smith asked if a copy was available of the report on internal radiation plutonium doses to workers. Professor Jones offered to take her address details and try to provide a copy of the report. He confirmed that reports were available for similar work on Sellafield workers.

AGENDA ITEM 4. BNGSL Monitoring Programme presented by Mr T Parker
38 Mr Parker apologised that no printed report was available. A report was usually produced, at a corporate level for all sites. Following the restructuring, the responsibility had devolved to site managements. The report for Sellafield was being worked on, but had not been ready in time. The information was available, the reports should be available in about 2 weeks time. It would be put on the web-site and a copy sent to all members, and any members of the public requesting a copy.

39 The Sellafield programme was similar to the FSA programme. He had picked out the key messages. The programme covers the same pathways as the EA/FSA and a similar area was covered – 15kms either side of the site and fish samples from prescribed areas.

40 The dose to the critical group was calculated as 240 $\mu\text{Sv}/\text{yr}$, it had been creeping up over the past few years as the consumption of seafood was increasing, over the same period. The dose was mainly from mussels, winkles and lobster (>75%), so the largest effort goes into this area of monitoring. Am241 and Pu241 are the main contributors, Tc99 had declined, C14 was a small contributor – linked to reprocessing. There was a slight increase in Pu discharges due to plant problems in 2003, these were now decreasing. Environmental redistribution of sediments was increasing Pu availability. Tc99 concentrations were up in 2003 though discharges were low in 2003, this was due to the 1.5 to 2 year time delay effect. They are now falling. The dose from Tc99 was following a similar pattern – decreasing slowly with the discharges. Lobster was the main dose source.

41 Cloud irradiation (Argon 41) has now gone since Calder had shut down and Ar41 was no longer part of authorisation limits.

42 The terrestrial programme was mainly within 4kms of the site and the farther away results were at LoD. For the terrestrial critical group the dose is 18 $\mu\text{Sv}/\text{yr}$. Milk is the dominant contributor, direct radiation and vegetation were small contributors, and the rest were minor contributors. For Ru106 and I131 a modelling approach was used.

43 Mrs Sherwen asked about milk samples used – there was now a large area for milk quotas, it included Dumfries and Galloway. The milk has to be well monitored, should the programme be wider for reassurance purposes?

44 Mr Hargreaves asked if the bulk of the dose came from historical precipitation, was there any estimate from current operations. Mr Parker said that was difficult. It could be done fairly easily for marine, there was very little data for terrestrial – it was difficult to untangle and models have unvalidated predictions. For Pu241, Cs137 and Sr90 it was possible, for others it was far more difficult. This was not a priority when the critical group dose was at such a low level. For I131 and Ru106, there would have to be justification that models are sensible when they were used instead of monitoring data.

45 Mr Hetherington commented that after 25 years of presentations, there was an issue as to how information was presented. Rather than quoting 18 $\mu\text{Sv}/\text{hr}$ against dose limits/critical groups – what is the average ‘Joe Public’ (ie not a major consumer of shellfish) getting? Are there more realistic presentations/perspectives available, compared to other things which people are at risk from? Mr Parker said presentations were geared to

demonstrate that the worst exposure was still within acceptable/safe limits - the other aspect can be presented. Mr Allott said the HPA was to produce PIE charts for dose intake for various counties – these were on the web-site, they would put doses into a local context. Professor Jones mentioned the National Dose Assessment Group which was looking at dose assessments by different agencies and now looking at communications. The group wanted members to join them from local authorities.

AGENDA ITEM 5. Comparison between RIFE-10 report and BNGSL data by Prof. Jones

- 46 Professor Jones commented on detection levels, a lot of results were at Limit of Detection (LoD) for terrestrial samples. Levels in marine samples were generally higher, with a much smaller proportion of LoD values. For the marine results, a good comparison was possible: this was not so with terrestrial, especially as the LoDs for RIFE and BNGSL analysis were often different.
- 47 In 2003, Cs137 results were basically in agreement. One porphyra sample was outside the range, but different sampling methods were involved (one sample v. an average of sample results). In 2004 for Cs137 there were more samples from terrestrial environment, so a wider comparison was possible. Marine samples were in good agreement apart from one sample of samphire. For the terrestrial environment, milk samples were in good agreement. However other samples showed much poorer agreement –possibly because there was a lot of spatial variation between sample locations (location/history differences).
- 48 Pu alpha results showed a good comparison for both terrestrial and marine samples. There were some differences in meat samples - BNGSL showing LoD values and RIFE showing positive results. With apples, both sets of results were positive but BNGSL results were lower – this might be due to differences in location and preparation (peeled v. peeled and washed v. not processed).
- 49 Tc99 showed a reasonable comparison. BNGSL results for porphyra were higher, but the RIFE had used one location, BNGSL was an average result that included samples taken closer to the discharge point. Nephrops results differed – from different locations (coastal v. offshore). Milk results were BNGSL 0.01 and RIFE <0.0035 – which suggested that the BNGSL result should be LoD.
- 50 For Sr90, Fucus and Porphyra were showing higher in the BNGSL results, but at LoD. Potatoes were at LoD for both BNGSL and RIFE, but RIFE achieved lower LOD values. Elderberries showed results of 0.09 (BNGSL) and 0.52 (RIFE) – possibly due to differing sampling locations.
- 51 As in all previous years, the results for C14 in marine samples were higher than those in terrestrial samples. Natural C14 in the background should be taken into consideration, specially for the terrestrial environment – BNGSL results are net of background, whereas RIFE results include background. Results were generally close to background levels in the terrestrial environment, but higher in the marine; in the marine samples BNGSL and RIFE results were in good agreement.
- 52 The habits assumed also affect the dose, these have altered over the past years. For the marine critical group, a 5 year rolling average is now used by both BNGSL and RIFE to calculate doses . In the past, BNGSL have been a year behind as RIFE results were not available in time. This year RIFE habit results were made available to BNGSL in advance of publication, so that both assessments of dose used the same habit data.
- 53 The results for dose to the marine critical groups were in close agreement:
BNGSL = 0.21 mSv/yr (BNGSL result for winkles is higher)
RIFE = 0.19 mSv/yr
- 54 Professor Jones commented that it was quite difficult to see exactly what habits had been used for calculations of the dose to the terrestrial critical group. The comparison of doses showed:
BNGSL for Adult 0.009 mSv/yr, for Child 0.01 mSv/yr, for Infant 0.012 mSv/yr.
RIFE for Adult 0.02 mSv/yr, for Child 0.023 mSv/yr, for Infant 0.036 mSv/yr.

- 55 Doses in both cases were small. Significant differences in the assessment could be determined, particularly:
BNGSL use measured air concentrations, RIFE use modelled.
BNGSL modelled I131 and Ru106, RIFE used LoD values.
The difference in assessed doses to the critical group is almost entirely accounted for by the difference between modelled I131 concentrations in foodstuffs and the RIFE LOD results for this radionuclide.
- 56 Mr Hargreaves asked about I131, now that the Calder reactors were shut down, was it now next to impossible to get I131 in this area as it had a short half life. Professor Jones noted that, in the past, it had been released from reprocessing of fuel that had not been adequately cooled. Mr Parker confirmed that the I131 inventory on site was now very much smaller than had been the case with the Calder reactors operating, and that there were many more procedural and measurement barriers in place now to prevent any short cooled fuel from being handled.

AGENDA ITEM 6. News items of environmental interest

- 57 Mr Parker said he had reviewed the events since the last meeting. There had been a discharge of Cs137 from the Waste Vitrification plant in April 2005. The results had not been available at the last meeting, the analysis showed the release (138 MBq) had exceeded the plant limit of 120 MBq. A slight pressurisation of the pipework had caused the release. The plant limit came into force for the first time in the new authorisation, which was introduced in October 2004 and based on previous operating experience. The dose from the incident was small ($< 1 \mu\text{Sv}$).
- 58 In August, in HLWP, there was a short duration release (1 hour), a breach of an operating rule, which was an INES incident. The dose was $< 1 \mu\text{Sv}$. An investigation was ongoing.
- 59 An anomaly with regard to I129 had been uncovered in Thorp analyses. No discharge limits had been breached, an internal enquiry was ongoing. Mr Parker will report on the conclusions from this at the next meeting. It was an analytical issue rather than a plant abnormality.
- 60 Contaminated land and groundwater investigations were increasing, the project was gathering pace. American experience had been recruited. The programme for the way forward with monitoring is ongoing.
- 61 BNGSL has just made a prescribed process application for non radioactive processes/plants on site (handling/discharging/environmental impacts). The application is considered to have been "duly made" by the EA, and is now being reviewed.
- 62 An EA consultation is ongoing for the LLW repository at Drigg. Some questions have been received.
- 63 Dr Emptage commented on the Cs137 discharge from WVP, the EA had responded with a warning letter and will follow up controls and improvements on plant. There had also been a breach of a uranium limit on SIXEP under IPC in April, the results had not been known at the time of the last meeting. The limit was on the plant, not on the site (uranium as a chemical, not a radioactive discharge). There were also strontium issues from the dosing of containers in FHP with caustic liquor. A warning letter had been issued with regard to IPC and RSA93 conditions. The EA was waiting for a response from BNGSL advising what they were going to do.
- 64 Dr Emptage advised that apologies from the NII had been received for the meeting, and reported that they were involved in the contaminated land and groundwater investigations, developing information coming from studies on site. They were pressing for more characterisation work, especially in the Separation Area. The groundwater monitoring programme is being looked at, this needs to be far more comprehensive.
- 65 Dr Emptage said the EA had issued an Enforcement Notice following the February inspection, BNGSL had responded to the notice and were concentrating on the follow-up work.
- 66 The EA were currently looking at doing upgrade work to the RSA Authorisation.

AGENDA ITEM 7. Works updates

67 Mr Parker reported on the Thorp incident, which had resulted in a loss of highly active liquor into a cell, work was ongoing to recover this. The NII had issued an Improvement Notice, work was ongoing to answer this. A plant restart in May 2006 was hoped for, subject to NII/EA approval.

68 Magnox Reprocessing had been shut down till the 22 October, and was now operating at a low level. This year's discharges will show low levels of radionuclides associated with reprocessing.

69 On the sealine recovery, Mr Parker advised that all of Sealine 1 had been recovered, and was all ready to go to Drigg. There was still work to do on the TESL and the other sealine.

70 A complex operation had been undertaken to refurbish an internal crane in Magnox waste silo, to allow work to continue – a hazard reduction exercise. This operation had been successfully achieved, work can now continue in cleaning out the waste silos.

71 The site had been audited by the insurers (from a consortium of insurers), a thorough review by 6 auditors over 5 days. They had concluded that BNGSL were operating first class effluent plants.

AGENDA ITEM 8. Environmental Health Matters.

72 Professor Jones said he wanted to refer to a paper and report dealing with radiation risks, principally external radiation.

73 The report by Cardis et al, had been published in the British Medical Journal (and was still on the web-site at the end of June). There were 51 authors to the report which was a retrospective study of cohort workers in 15 countries, a big study. It was not a meta-analysis (usually problems with dose calculations and different groupings). The cohort data had been reassembled in a coherent way. There was significant evidence of risk for cancer, similar to the Hiroshima and Nagasaki event cohorts. A small excess risk of cancer showed, even at low occupational doses received by nuclear workers in the study.

74 A summary (46 pages) from the US Committee on health risk of exposure to ionising radiation was on the BEIR website. From the summary, risk estimates are similar to ICRP estimates. A linear no threshold approach is the most appropriate for risk assessment. This will be worth looking at again when the full report is available.

75 Ms Allis-Smith commented that Martin Forward was just back from Japan, and that while Sellafield would like to think it had no link with leukaemia (blaming this on a virus brought in by mixing of population), Japan was building a reprocessing plant which was not yet operating, but there was no evidence of any increase in leukaemia as a result of population mixing. Professor Jones replied that the set up round Rokasho Mura was interesting. In the UK, he was not aware of any new work on population mixing in the last 5 years, the last report had been from Newcastle showing positive evidence that leukaemia incidents in Cumbria were not related to Sellafield. COMARE will probably be interested in this again.

76 Professor Haywood commented that no-one had ever said that population mixing was the complete explanation, or to what extent it contributed. If there was no elevation of leukaemia in Japan, we don't know what it was not caused by.

AGENDA ITEM 9. Election of Chairman and Vice Chairman

77 There being no other candidates forthcoming, and the present holders of the posts of Chairman and Vice-chairman being willing to continue in these posts, they were re-elected.

78 AGENDA ITEM 10. Any other business.

79 Mr Parker referred to the review of the BNGSL monitoring programme, the proposals from which had been presented at the May EHSC meeting. These applied the principles and some additional elements, that the EA required. The review document had been

discussed with the EA and additional information provided. A revised programme for inclusion in the next financial year was hoped for, featuring a reduced level of food monitoring and an increased ground water monitoring element – against the objectives and principles presented at the May meeting.

Dr Emptage commented on the reduced programme, check monitoring was done on 10% of the sampling. There was almost 100% duplication of the FSA programme – this is the area that is being reviewed and needs to be understood. There would be an effect on Professor Jones' comparison next year. The proposed reduction would free resources to look at groundwater monitoring. If the FSA reduced their programme, there would be a need to review the BNGSL programme.

- 80 Mr Parker said that for the key area, the main dose contributors (marine and milk) will still provide enough information for the comparison. The single meat sample, where a sensible comparison can't be done, will be dropped from the programme.
- 81 Dr Emptage advised that the Article 35 report had been published and was now on the EC website (address below). The UK government was looking to respond to the EC, the EA and FSA etc were inputting information into that response.
<http://europe.eu.int/comm./energy/nuclear/radioprotection/doc/art35/main.findings-Sellafield.pdf>

The meeting closed at 4:06pm