The following are some of the personal testimonies from people involved in the fire at Windscale, Sellafield, in 1957 and some statistics on estimates of the health impact of the fire. The plume of radioactive contamination spread across England into Holland and Germany and also across into Ireland.

In some cases I've changed the tense from when I wrote the book (Living in the Shadow, the Story of the People of Sellafield), when some of those interviewed were still alive, but of course what they said remains the same. In particular in typing this out - and with the benefit of hindsight and more knowledge – the sense of the risk they took with their own lives, and the massive gamble taken to put the fire out – seems all the more vivid.

All that is asked is that you give some time to read this and remember the fire, those who fought it and the victims.

Jean McSorley

9th October 2007.

(If you want to use extracts please reference this material).

Finding the Fire

Arthur Wilson (now dead)

'I opened the gag-port and there it was, there was a fire at the face of the reactor.' These are the words of Mr Arthur Wilson, the 'Man Who Found the Windscale Fire'. The blaze he discovered on the 10th October 1957 signaled the beginning of the world's second biggest nuclear disaster.

Mr Wilson was a master of understatement. 'I can't say I thought a lot about it at the time, there was so much to do. I didn't think "Hurrah, I've found, it." I rather thought, "Oh dear, now we are in a pickle." In some ways I was quite lucky because I had been on duty so long that day I was allowed home quite soon after the fire itself was discovered. It's the other poor souls I feel most sorry for, the ones who had to go in and sort out the mess. Some of them got very high doses and I'm sure things weren't recorded properly then. In fact the reaction of the management to the news that there was a fire was "Don't be so bloody daft." I don't know what they expected. For days it had been going wrong.'

'It' was the planned release of heat from No 1 of the twin Plutonium Piles at Windscale which supplied Britain's first nuclear weapons material. By today's standards the reactors were badly designed and hastily erected. Many problems had not been foreseen, like the heat build-up which occurred from time to time in the graphite surrounding the hot nuclear fuel in the reactor. This graphite acted as a 'moderator' by soaking up the excess energy coming off the fuel as it was burnt in the reactor. The heat caused the graphite to expand in size and so had to be got rid of by blowing air across the graphite and allowing the heat to escape from a 400 foot chimney. The operation had been successfully undertaken twice prior to 1957.

‘I can’t say that any of us were very much worried about what happened. We thought we were undertaking a routine operation. I was there at the time because I was an instrument technician and it was my job to fit the thermocouples to the reactors. Thermocouples are sophisticated thermometers which kept track of the heat build up in the reactor. We’d actually started the energy release on the Monday and by Wednesday morning the temperature should have gone down. But we could see from the gauges that the temperature was will rising. There was a sense of “what next”, but not in a worried sort of way, just what do we do to sort it out? On the Thursday morning there was no way of knowing the temperature as some of the thermocouples had burnt off, we’d tried attaching new ones, but they burnt off too. We were stood on the charge hoist and someone suggested that we actually had a look at the reactor itself. It didn’t seem such a bad idea. There were holes which were used to put the fuel in, you could also see inside the reactor through them. We thought “what the hell”. I was first to look and then I saw the thin wisps of flame, nothing very spectacular, but then I suppose it was spectacular enough in itself.’

Arthur Wilson, born in Millom, started work at Sellafield in 1951 after he left the army. He worked in a number of the building on site. Her recalls how inefficient the health physics people were in those early years. ‘One day I was called in because I had a sample of urine contaminated with plutonium. I remember feeling quite worried about this for days, it was the first time I had cause to worry. Like most people I was n the thick of things. I enjoyed work. We were leading a new technology and I was part of it. There was a challenge to invent, to get round problems. When the results of the second test came back I was relieved to know that I was clear. The health physics people said my sample had been cross-contaminated. That was it. I never asked by who or what and they never told me. It wasn’t for some time that I thought about my contamination and that I said to myself: “That’s a devil of a thing to happen.” Did someone else get the all-clear, but in fact were contaminated? I decided to test them. I took my radiation badge and sat it on to of a very radioactive source in the separation plants. I knew it was radioactive because I had a Geiger counter with me. I then went off and did a job in a nice clean area. I came back, got the badge, and handed it in and waited. Not a beep out of them. That badge must have shown I was over-exposed, there’s no way round it. But it shows what we had to suffer in the early days. I suppose the only excuse is that the world was new them or at least it felt that way after the war.

But even before the 1957 accident Arthur Wilson had begun to notice pains and loss of feelings in his legs. By that time he had already been contaminated in various routine operations. On one occasion he had had to open a plate on the separation route in order to move one of the highly radioactive fuel rods that had stuck in the processing machinery. ‘I remember whipping open this “hatch” and seeing this fuel rod only some five foot from me. I belted it quickly and the slammed the lid shut.’ Other dangerous operations included going into the base of the reactor and pushing the hot spent fuel rods into the cooling pond that had landed on a side ledge by mistake. As he become more and more ill, Arthur Wilson began to question the company doctors. He was told that they had no idea what was afflicting him, but that it wasn’t radiation linked. ‘How could they say they didn’t know what it was in one breath and then exclude radiation in the next?’ wondered Arthur. ‘I wasn't out to skin them, I just wanted to know. I was only thirty-six. I was being paid off. I knew I’d never work again. Well, never do normal work again. I could only walk using sticks. They gave me £400 superannuation. I’ve never seen or heard of them since, not even a Christmas card from the unions. Perhaps they regard me as a bit of an embarrassment. But I’m an old man, what are they afraid of?’

Arthur finished work at the plant in 1961. Photographs of him taken at the time show a handsome, fit looking man. In some of them he is pictured with the telescopes he designed and built. When I visited him for the interview, I noticed the little pieces of carpentry he worked on for home furnishings, these lay around the floor of one room of his house. He never got to complete the work. By 1990 the health had deteriorated to the point where he was crippled and could only use his right arm, and that got tired easily. Arthur lived alone in a council bungalow. Although he was wheelchair bound he valued his independence. In 1988 he spent the last of his savings on a motorised wheelchair and he did not want to live in a residential home. Even in great pain his mind was still alert and his spirit is strong. In 1967 a neuron-surgeon examined Arthur. He reported that he believed his illness could be radiation linked, although this statement was later withdrawn. Cumbrians Opposed to a Radioactive Environment (CORE) tried to get Arthur's claim looked at again, but because he did not have a cancer he could not claim under BNFL's compensation scheme. Eventually we had to abandon Arthur's claim as he could not face the pain of going through more tests on his spine.

Fighting the Fire

Tom Touhy – interview in 1989, still alive

Tom Touhy was the deputy manager of the Windscale & Calder Works at the time of the 1957 fire. A chemist by training, during the war he spent part of his time at Drigg and Sellafield when they were explosives factories. After the war he was offered a job in the newly founded nuclear industry. As Touhy says, 'Who wants to make TNT when the atom bomb has gone off?'

After a two year spell at Springfields, British Nuclear Fuels Limited (BNFL) fuel fabrication plant, Touhy became deputy manager at Windscale and then general manager in 1958. In 1949 he took charge of the Windscale Plutonium Piles and in 1950 was asked to start up the plutonium finishing plant which made the finished metal for nuclear weapons. 'We made the first small billet of plutonium, 142 grammes I remember, about the size of a ten-pence piece. I broke down the first reaction vessel myself, with these hands, I was the first man to handle and see a piece of entirely British-made plutonium.

Touhy was in charge of on-the-spot operations for dealing with the fire and remembers quite vividly what took place. 'I was at home when the thing started. I got a phone call from the then general manager, Henry Davey, who said, "Pile Number One is on fire." "Christ, you don't mean the core?" "Yes, can you come in?" Naturally told him I would. My wife and children were all in bed with Asian flu. I said, "Look, there's trouble at Windscale." She asked "When will I see you?" and I said I hadn't clue.

'I went in and didn't go and see Davey in his office. I went straight to the source of the trouble, as I always did. On the charge hoist of the reactor a team of men were busy trying to isolate the fire by discharging the fuel around about where they thought the fire was located so it couldn't spread.'

Because there reactors were the first they were quite different from those used today – a fact that helped enormously in dealing with the blaze. The metal fuel rods in the old reactors were pushed in horizontally, not lowered in from the top as in modern ones. The reactor was a series of graphite blocks and 'fuel channels', which looked like a chequer board from the

front. To get access to the reactor face you pulled plugs out of what was called the charge wall, which was about four and a half feet thick reinforced concrete.

The fuel was simply pushed into the reactor through the channels. In between the wall and face of the reactor was an air duct through which the piles were air cooled. This process of putting fuel in or pushing it out was known as charging and discharging. Old fuel was discharged at the back by pushing fresh fuel in from the front. A special machine, the charge machine, had been designed to do this job. Attached to the charge machine was a tube which spanned the air duct. Each plug gave access to only four fuel channels at a time. The charge machine was meant to b able to locate each of the four channels in turn. However, this did not work reliably and instead ordinary household bamboo drain rods were used to put fuel in or push it out. In those days there were no TV cameras inside the reactor to tell workers what was going on, so they had to actually look inside. The huge piece of machinery from which all of this was done was known as the charge hoist. This could be move up and down in front of the 80 foot-high reactor.

Touhy explains: ‘I spent most of my time on the charge hoist where the men were trying to put this ring around the fire. When we’d got a ring of empty channels rough around where the fire was, I decided to try and discharge some of the burning fuel channels. I got the men to pull out a number of these plugs and looked into the reactor, which is not recommended under normal circumstances. By having various plugs pulled out I defined the area roughly were the fire was. The fuel was glowing red at this stage. Normally there wouldn’t be any sign of heat at all.

This was not a nuclear reaction. ‘It was like a fire in a grate, except we had burning graphite and burning uranium. One of the troubles was the only coolant we had at this stage was air, and air and fire are not very good companions. You had to keep a certain amount of air going through the system fans because of the ventilation to the charge hoist, where the men were working. If you interfered with that you could get a lot of contamination coming back whenever you pulled one of the plugs out. Also if you took off all the cooling we didn’t know how much residual heat (known as Wigner energy) was still in the graphite. We’d got a nice little fire in the middle of this and if you supply no coolant at all to the surrounding graphite and there’s still Winger energy you can have a much bigger fire on your hands.’

The management of the plant faced major problems. ‘Drain rods were no good whatever for trying to discharge the burning fuel because they were ordinary drain rods made of bamboo. So we got steel rods and tried to push this stuff out but a lot of the fuel was in a molten start which you obviously couldn’t push through.

‘I had a gang of men sort of heaving on the end of each pole. Very little was happening. I remember the poles were coming back absolutely red hot. Individual fuel elements were only a foot long and they sat on T-shaped pieces of graphite called graphite boats. On one occasion when a rod came back onto the charge hoist there was a red hot graphite boat came with it which dropped onto the charge hoist. I remember kicking it over the side and molten metal, which must have been uranium, was also dripping off. We decided to abandon this as being hopeless and kept trying to discharges the burning fuel and make a bigger ring around were the fire was.

‘One way of trying to define how bad things were was to go right up the top of the reactor and look down the back of it. We had to go up 80 feet and there were no lifts in those days. It

doesn't sound very much but if you're carrying 35 pounds of breathing equipment on your back and you've got a full face respirator on, by the time you get to the time your chin is swimming in your own sweat.

At the top of the reactor was the 'discharge duct' where the used fuel was pushed out of the reactor. This fuel fell down into water which contained bogeys. Above this discharge duct there were four holes through the top of the biological shield. They were normally plugged, but in the shut-down state, leading up to carrying out the Wigner release, these plugs had been taken out and they were merely steel discs on top. These could be taken out and the mean could look down into the duct. When Touhy first looked into his duct there was no sign of fire.

'I alternated my time between the charge hoist where the discharge operations were going and going up to the roof to look down these inspection holes at the back to see if I could see any sign of the fire. First there was a red glow as the fire was spreading down the channel, then there were flames coming out the back, then there were massive flames shooting right across the discharge duct and impinging on the concrete wall at the back of the duct. Here was I looking at this knowing that the civil engineers had said that if that wall exceeded 600 degrees centigrade the roof on which I was standing could possibly collapse it wasn't a pleasant thought.

'We'd got to think of some alternative cooling to the air which we were having to keep supplying so we could live on the charge hoist. But we had to keep the graphite cool to some extent. I was as reluctant as anybody else to use water. We decided that we'd have a go with carbon dioxide. Because Calder Hall was cooled with carbon dioxide a tanker with 25 tons of liquid carbon dioxide had come into Calder that day. However, because of experiments we had already done we did not think it would work.

'We had difficulties with the hoses to the face of the reactor. Because the charge hoist could be located at all sorts of levels the way to get up there was a service lift. You can't shut the door with the hose in the way. However, there was an escape ladder from the charge hoist, in case the service lift failed, and we managed to get the hose up the escape ladder and onto the charge hoist. I had some men pull a plug out of the wall and put this tube in, spanning the gap which wasn't just glowing red hot, it was flaming all over the place. I watched what happened, again a rather unhealthy thing to do, but there was no other way of finding out what was going to happen except to look at the channels. It was exactly as I said, nothing happened, it just went on burning as merrily as before.

'The only other thing we had available in any quantity was water and this was a sort of last resort. If you mix steam and graphite you make a gas which is a mixture of hydrogen and carbon monoxide, which can explode violently, so it is not a very nice mix. Anyway, we made the decision to use water and again setting hoses up was difficult.'

The reactor had holes in it in which could be placed containers for making various other radioactive materials, such as Polonium-210, which was used as a trigger for nuclear weapons. The hoses carrying the water were attached at one end to a fire engine and at the other to tubes placed in the isotope holes. Tom Touhy had gone on site around four in the afternoon; it was now five in the morning.

‘By this time, of course, the charge hoist was very radioactive because of the molten irradiated uranium dripping on the carpet, so to speak. The radiation levels were building up all the time. We had the men on the charge hoist in relays so that none of them got a very big exposure. I got by far and away the biggest exposure that night. You had to wear a mask so you didn’t breathe any of the dust, that was absolutely vital. By seven o’clock in the morning we were ready to put water in the system. But there was a problem as the people on early shifts were arriving and then other staff continued to arrive until about nine o’clock.’

‘Not quite knowing what was going to happen when the water went on we couldn’t turn it on until we were assured everybody was under cover. I decided not to fire the water directly into the burning uranium because I was frightened of an explosion arising from the cold water hitting this very hot metal. I thought I’ll not put it on direct. I chose places for laying the hoses where were about two feet above where I knew the fire was.

‘The graphite core of the reactor is not solid. It’s made up of lots and lots of individual blocks with gaps in between to allow for expansion of the graphite. I knew that the water would trickle down and so get at the fire. The fire chief, a man called Bill Crone, was very good. He and his team were outside and the chief engineer, Donald Ireland, acted as a sort of runner between me and the fire chief. I asked for 30 pounds of pressure on the water supply and sat down at the entrance to the service lift, as near to he charge hoist as I reasonably could, listening for any horrible noises. Well, there weren’t any at 30 pounds, so after about ten minutes I asked for 60 pounds and listened again, then 90 and then 120, which was full pressure. There were no bumps in the night as it were.

‘Outside you couldn’t see a lot from the fire itself. There was a sort of heat haze over the chimney, before we put the water on, you could see the air shimmering. That was the first time we’d ever seen anything coming out of the chimney. No real smoke, just a sort of heat haze. Of course, when the water went on we immediately produced steam so the thing was steaming. Then I wondered whether we were making full use of the water or whether in fact a lot of it, with the pressure, was coming straight through the channels out the back. I went up on the roof yet again, for the umpteenth time, looked down the inspection holes and sure enough, a lot of it was just going straight through and not trickling down, it was being wasted. I had the pressure cut back and I think I settled on 60 pounds when most of the water was actually going onto the fire.

‘When my deputy, Tom Hughes, came back into work the pair of us went up to have a look at things from the roof of the reactor. The water wasn’t really showing any particular extinguishing effect. It was having some cooling effect, because we were producing steam. As there was nobody on the charge hoist we didn’t need ventilation there. As we’d got an alternative coolant, in the water, we didn’t need to keep the air going through to cool the surrounding graphite. So we decided to shut off all the air.

‘When I had the shutdown fans turned off I went back up to the roof again. I had one hell of a job to level the discs off the inspections holes at the back. The fire, now not being fed with air, was trying to get air from wherever it could. There wasn’t a rush of flames, as it was now almost certainly pulling air down through the chimney. It was dramatic. I could see the fire dying out. I could see the flames receding and by about twelve o’clock I could see nothing. As far as I was concerned the fire was out, but we kept the water going for another twenty-four hours. Then we had a mess, because the water, which was radioactive now, was coming out all over the place. It flooded two forecourts. We really had a bit of mess on our hands to

clean up. The filters that were at the top of the chimney were very radioactive, particularly with radioactive iodine and certainly strontium.'

'What happened at Chernobyl was a very different proposition because that just went off, pop! The sort of situation that the men and I on the charge hoist were facing was tackling the fire throughout the night. It was a meltdown, if you've got burning metal then the stuff is melting. The fire never spread beyond the original 140 channels, although it spread along the channels.'

'This situation hadn't been envisaged. That's why we had no provisions for dealing with it. We had to improvise and our improvisation was brilliant. In fact I think we got a pat on the back from the Board of Inquiry under Sir William Penney. Quite a night. I'm glad I was there, but I'd rather not do it again.

The full version of the official report on the accident was eventually released in January 1988 under the Official Secrets 30 year rule. It claimed that the heat build up went too far as the thermocouples were in the wrong place to measure the points of highest temperature. But, as Arthur Wilson has lived to testify, he and others had put the thermocouples in the places designated, so it really was a design fault.

There are many who believe that the likes of Touihy and others who fought the fire should have got far more recognition for what they did. In 1964 Touhy was promoted to Managing Director of all the United Kingdom Atomic Energy Authority plants, but this is because he was well due for promotion. In the Soviet Union firefighters and others involved with Chernobyl were publicly presented with medals and feted like heroes, but in order to play down the significance of the event, and to suppress public interest in our nuclear-bomb factory, mean on the site had to be content with 'a pat on the back.'

Like their Soviet counterparts the Windscale men were exposed to radiation whilst dealing with the fire. Touhy does not know how much radiation he received that night. 'Why it happened I don't know, but for the latter part of the night when it was getting worse and worse on the charge hoist I didn't have monitoring equipment on me. I was just a bit afraid somebody would come along and say, "Look, you've had too much" and I knew I had to be there. They did estimates and I think they reckoned I got about four years' maximum exposure as it was then.'

The radiation dose Tom Touhy estimates he received would approximately 200 milliSieverts (mSv - a measurement of radiation). The limits for workers now are set at 20mSv average in any one year over a 5 year period, with 50 mSv allowed in any one year – so no worker is meant to be exposed to more than 100 mSv in a five year period. For comparison, 5 mSv is chest x-rays.

However, Tom Touhy's experience has convinced him that radiation is much less dangerous than we think. 'It just shows you can have a lot more radiation that is being said, without it having any real adverse effect. They've been paying out compensation on really very moderate doses of radiation which in my opinion is ridiculous. I'm walking proof, a pretty good physical specimen in my seventy-second year, radiation or no radiation. There is absolutely no justification for the fuss being made about leukeamia or anything else. To some extent it serves the present management right for getting themselves into this stupid position

by giving compensation when compensation was never justified. If you do that once they you're on a slippery slope.'

The quiet confidence of Arthur Wilson and Tom Touhy was not shared by everyone. Jack Coyle told me how he felt after that night. 'I was at Sellafield from 1951 until 1980. I was worked as a maintenance fitter and when the fire went up I was asked to stay on site. I didn't want to, I can't say why. I hadn't really thought about the danger up till then, it was like the war really, until you got the front I don't suppose you really thought about it.

'The worst moment was when they put the water on to dowse the fire. I remember I wanted to run, I felt really scared, but you'd never admit as much to anyone. All the scientists I'd seen that day looking really worried, not their usual cocky selves. One lad standing next to me said, "We should open a book on it, you know." He meant have a bet. I thought to myself I'd win a bloody race if it was out of this place. I asked someone if they thought it would take long as I wanted to get home. He said, "You daft bugger, we all want to get home, but they'll not be letting us go if this goes wrong. We'll be lepers if we go home covered in this stuff." For some of the men it almost seemed exciting. I read about those men who came from Capenhurst in Cheshire to help fight the fire. God, they must have been mad. After helping clear away some of the safety equipment we were allowed to go. I wanted to walk back home. I felt strained. On the way up my street, I just stopped walking. I just thought, my God, I might never have seen home again. After that, well, I can't tell the strain it's put on me. I suppose most of the time I just buried it. I hated the place, but what else could I do? I felt particularly bad when they agreed to those Japanese spent fuel imports. I wondered then what all the bloody sacrifice had been for during the war.'

Aftermath

Jack was not the only person concerned about the people outside. As Tom Touhy explained, the workers thought the public was being taken care of. 'The health physics people of the time first detected that there was some trouble with the reactor by having picked up high readings in atmospheric samples. After the fire people felt pleased with themselves because the first milk samples were negative. But twenty-four hours later the radioactive iodine began to come through and so they had to impose a milk ban.'

As Touhy was the works manager at the time, he admits he did not know exactly what was happening over the perimeter fence. 'Quite honestly I can't answer if the public was warned at the time. I was involved with fighting the fire and was only interested in getting the bloody fire out. I was living nearby at the time and before I left home I made sure all the windows were shut. I knew that there'd be a certain amount of radioactive airborne activity, but I knew the filters were darn good too.'

Touhy's confidence was not entirely justified. Local farmer Tyson Dawson recalled: 'We had two sisters who both had babies at the time. During the Friday they were parked in their prams outside, right next to the factory fence. One was just four months old and one was eighteen months. The wind was coming from the west and it was drifting our way. Actually we felt rather odd at the time of the fire because our house was probably 200 yards from where the factory was, right up against the factory fence and the following morning, this occurred on the Thursday, on the Friday morning we were looking down on the works and everyone was going home at 10.30am and we were wondering why.

‘We were quite annoyed when we found out because it was enough for the workers the other side of the fence to go home and we had these young babies. Fortunately they've never suffered any ill effects. We never got to know until through the night on Saturday about two o'clock on Sunday morning. A knock came on the door. Of course I got up to see who it was. It was the local policeman with an official from the works. We hadn't to drink any more of our milk - we had to take other precautions. It was a very serious thing if we drank milk. At the time of the fire itself they didn't seem to have a great deal of information, but one of the things they stressed was we hadn't to eat any of the vegetables that were grown on the farm, but particularly the milk. Of course we didn't really believe this. I was quite annoyed because we had gone almost three days before they had informed us there was anything seriously wrong with the works.

'People were worried at the time of the fire. We had a big meeting with farmers at the village of Gosforth near Sellafield a week after the fire. It was rather funny because they all came to have it explained by the Windscale officials, what had happened and why. The local people living round weren't the least bit concerned, but all the ones from round Kirkstanton and Whicham valley – they were most concerned, terrified almost, frightened to death. I knew these people. When I met them at this public hall I said, “Why are you so afraid?” and they said, “This is going to be terrible.” I asked them how they would like to live against it, at the fence, right against it, if your house is only ten yards away. They said they'd move away. It's funny how they were worried even though they were from further away.

Some of the workers themselves were not fully informed. Val Hampshire was eighteen when the accident took place. She was working on the first trigger for nuclear weapons, Polonium-210. A canister of this was in the Pile at the time of the fire and much of it was released over the surrounding countryside. Val remembers, 'I wasn't aware that I was working with polonium. It was so sensitive it had a code name at the time which wasn't its element code. It was always known as LM, so that is why I never made the connection. I didn't know the connection between the bomb and the trigger until after I had left. That there was polonium at the bottom of the pile which was released during the fire was something I didn't know at the time.'

(Polonium-210 is one of the most toxic substances known to humankind, more toxic even than plutonium. It is now infamous as the material used to kill Alexander Litvinenko the Russian dissident in 2006. It has a half life of 138 days).

That the authorities were worried at the time is something Val Hampshire reflected on years later. 'We were all so young. To use the fire was an exciting thing. The day it happened we weren't told. The day after a lot of us were sent with a driver to the local farmers to tell them to destroy their milk, to pour it away. I had to have somebody else with me because this must have sounded a bit crazy coming from an eighteen year old. Of course communication wasn't that good anyway, some of these farms were very remote. I didn't feel threatened at all, but obviously my brother-in-law did. He stopped his children drinking local milk and bought in evaporated milk and that's what they had for years. He was a scientist at the Freshwater Biological Institute. He placed a core sample at the bottom of one of the lakes in order to test for the Caesium-137 fallout.'

At the time of the fire Val was married to Judd Weldon, who was the site photographer. The camera he used to try to take photographs inside the reactor building after the fire was eventually sent to the low level radioactive waste disposal site Drigg, a few miles south of

Sellafield. None of the photographs ever came out because the radiation had clouded the film. Judd died of leukaemia in 1983.

The local police were so worried about the outcome of the fire that they had emergency rolling stock drawn into Whitehaven rail yard in order to evacuate people. It's hard to imagine now, in 2007, that the authorities would think that the population around a nuclear plant would patiently wait to be herded onto trains in order to be evacuated.

Health impacts

Some research was done from 1958 to 1962 on the health of Cumbrian people. To my knowledge this information has never yet been released.

However, some work on estimates of the potential health effects of the fire was eventually undertaken. In 1981 the Political Ecology Research Group (PERG), an Oxford based science research group, issued its estimates of the numbers affected by the 1957 fire. They discovered that the accident had released 100-1,000 times more radioactive Iodine-131 than the Three Mile Island accident in America in 1979.(1)

The cloud passed over England into Holland Germany and finally southern Scandanavia, as well as Ireland. PERG concluded some 250 thyroid cancers had been caused, some 13-30 of which would be fatal. In February 1983 the National Radiological Protection Board (NRPB - now the Radiation Protection Division of the Health Protection Agency) published its first report on the fire, in which it agreed with PERG's report (2). The Board was at pains to point these were hypothetical deaths, that is they were estimates of what the fallout could have caused but that there was no evidence (proper statistical analysis or known cases of individuals they could name) to account for this figure.

The head of health physics for the United Kingdom Atomic Energy Authority at the time of the fire was Dr John Dunster. He had measured the polonium levels in the area around Windscale after the accident and published the results. However, when the NRPB published its report on the fire it failed to take into account the polonium, even though by this time Dunster was its director!

An estimate of the possible effects of the polonium was published when John Urquhart, a statistician from Newcastle University, unearthed Dunster's early monitoring results.(3) Urquhart also had a copy of a report which the NRPB had done on the effects of Polonium-210 from coal-powered plants. Using the NRPB estimates for the uptake of polonium in meat and milk given in the report on coal, Urquhart calculated the 240 curies of polonium released from the fire would cause 1,000 cancer deaths. The NRPB then back-tracked on its earlier figures and it dismissed the figures used in its own assessment from coal-powered plants. The Board also attacked the methods used to measure polonium in 1957 and said that there would be 'inconsistencies.' It eventually issued a report saying that the polonium-release would have caused, possibly, an extra twelve deaths.

In 1988 Roger Clarke, by this time director of the NRPB, published another reassessment of the impact of the fire saying that there would be 9 non-fatal cancer with a possible 100 fatal cancers. (4)

On 7th October this year a report from two nuclear scientists estimated that the releases had been twice as much as previously thought. They estimated that the number of fatal cancers would be 240 (5)

Victims of the fire

One of the authors of the original NRPB reports on the fire, Dr Linsley, said that those living near Windscale at the time of the fire would be twice as likely to contract thyroid cancer due to the fallout, with children most likely to be affected. The risk of their developing thyroid cancer during their lives as a result of the accident was one in a thousand. In 1984 Professor Fremlin, then Cumbria County Council's radiation advisor, had suggested that an ex-gratia payment should be paid by the Government to anyone who contracted thyroid cancer in the Windscale area within twenty years of the fire. It is not possible to prove beyond doubt that any cancer is actually caused by natural or man-made radiation. Later legal action against British Nuclear Fuels Limited, for cancers caused by the fire and the radioactive discharges did not succeed.

Unfortunately for Alix Bryson, her thyroid cancer manifested itself twenty-one year after the fire, a year too late for her to ask for an ex-gratia payment, as suggested by Fremlin (not that there was any suggestion the Government would have paid out). She was at school nearby the plant when the fire happened. 'I do recall a little bit of panic and some of the parents came in the night and took their children away, but there was no feeling that there was anything to worry about. 'In 1979 Alix found she had a lymphoma of the thyroid gland. 'It was about a year after that when there were reports about Three Mile Island nuclear accident and I read a report that it wasn't nearly as bad as the Windscale Fire in 1957. I was stunned. That's when I first thought about the connection. Now there is no doubt in my mind there is a link.' Alix had her thyroid removed and underwent extensive medical treatment. 'It was a very frightening experience, a terrible time, and I want other women who were at my school in 1957 to go and get check-ups now so that it will be discovered early enough. When I tried to get some sense out of the authorities they wouldn't admit to any link at all. They won't accept the responsibility, although this type of cancer occurs only through exposure to radiation.'

(1) PJ Taylor, 'The Windscale Fire, October 1957', report from the Union of Concerned Scientists, Cambridge Mass (PERG, 1981)

(2) M J Crick and G S Linsley 'An assessment of the radiological impact of the Windscale reactor fire, October 1957. NRPB R135

(3) Polonium- Windscale's most lethal legacy. John Urquhart, New Scientist 31st March 1983.

(4) R H Clarke, 'The 1957 Windscale accident revisited; International Conference on the Medical Basis for Radiation Accident Preparedness, 20-22 0ctober 1988

(5) http://news.bbc.co.uk/1/hi/sci/tech/7030536.stm John Garland (formerly UKAEA) and Richard Wakeford, visting Professor Manchester University (and formerly BNFL) in the Journal of Atmospheric Research.