David Stewart : a Carolside parent working as a scientist.

Mr. Stewart has an honours degree in Information Technology, Chemistry and Systems Instrumentation.

His first science job was for Scottish Water as an Assistant Chemist. The water you drink has gone through several processes before it comes out of your tap!



At Aptuit, he worked as a Chemist, testing blood samples to determine dose intervals for drugs. Packets of medicine have information about how much you may take and how long you must wait before taking more. This information is worked out by chemists who analyse samples of blood from volunteers taken before, during and after a test dose is taken.



His next job was at Nalco, analysing and treating the water in cooling towers and boilers. Pools of warm water can become breeding grounds for dangerous bacteria and must be monitored and kept clean.



Currently, he works as a member of the Operations Team on a production rig in the North Sea. As a member of this team, he is responsible for the safe, clean and efficient running of the rig. Chemicals harmful to humans and damaging to the rig may be in the oil coming out of the wells and the equipment on the rig works best when the balance of oil, water and other chemicals flowing through them are precisely controlled. Once separated from the oil, the water discharged from the rig must contain less than 30 parts per million of oil. His team carry out systematic checks on the instruments and patrol the rig looking, listening and feeling for anything that is not normal. Observations made with any of the senses can alert a member of the team to a problem: an unusual sound; a strange vibration; an odd colour on the sea around the rig.



Samples of the discharge water are checked regularly and, in the event of a sample showing contamination, the Operations Team must work fast to find the cause. If a sample is cloudy, the first thing that they will check is the clarifier pump – a device which puts a chemical treatment into the water to remove the last traces of oil. If it is not working properly, it may need to be repaired or changed. If it is working properly, the next things to check are the Hydrocyclones – machines that spin the water to separate it from the oil. They may have built up gas pockets that prevent them from working properly and need to be cleared. The oil that they separate leaves through the Oil Reject Line, which is controlled by a valve. If this valve feels cold, then it is not working and may have picked up a coating of wax. A radio call to the Control Room Operator will be made to ask for the valve to be ‘cycled’. This means fully opened and fully closed before returning it to the position it should be in. After each change, the water is sampled and tested again to see if the change has fixed the problem.

While carrying out the inspection, one of the Operations Team observed a strange sheen on the sea. The Operations Room reported that the instruments were showing normal operation but a visual check of the system did not match what the instruments were showing and sample of the discharge water was observed to be pink! Mr. Stewart knew that a ‘rise’ (a part of the system of wells) that had not been used for a long time had recently been brought back into production and guessed that bacteria had grown in it, although it had been treated with biocide to prevent this. Acting on this theory, he sent a sample to be tested for bacteria. A lab worker confirmed the presence of bacteria. The machine would only work with a mixture of oil and water, not a mixture of oil, bacteria and water and the contents of the machine had to be sent to shore in the oil pipeline (not what the refinery wanted to get) but the rig returned to normal operation. Samples of the discharge water were taken again and found to be normal.

The Operations Team are always listening – to each other and to the Control Room Operator. Their talk must be clear and concise (short but containing the necessary information). Listening to people from different parts of the country with their different accents can be difficult, especially over the radio – each member of the team may be in different parts of the rig trying to locate the cause of a problem – but each takes care to be clear and to be polite when they do not understand. “Please repeat.” is their standard request when they have not heard or understood.

Mr. Stewart believes that scientists working in the real world must adopt a problem solving approach and should be able to act independently if they have “good reason to think that a course of action is right” and should “have the confidence to have a go”.