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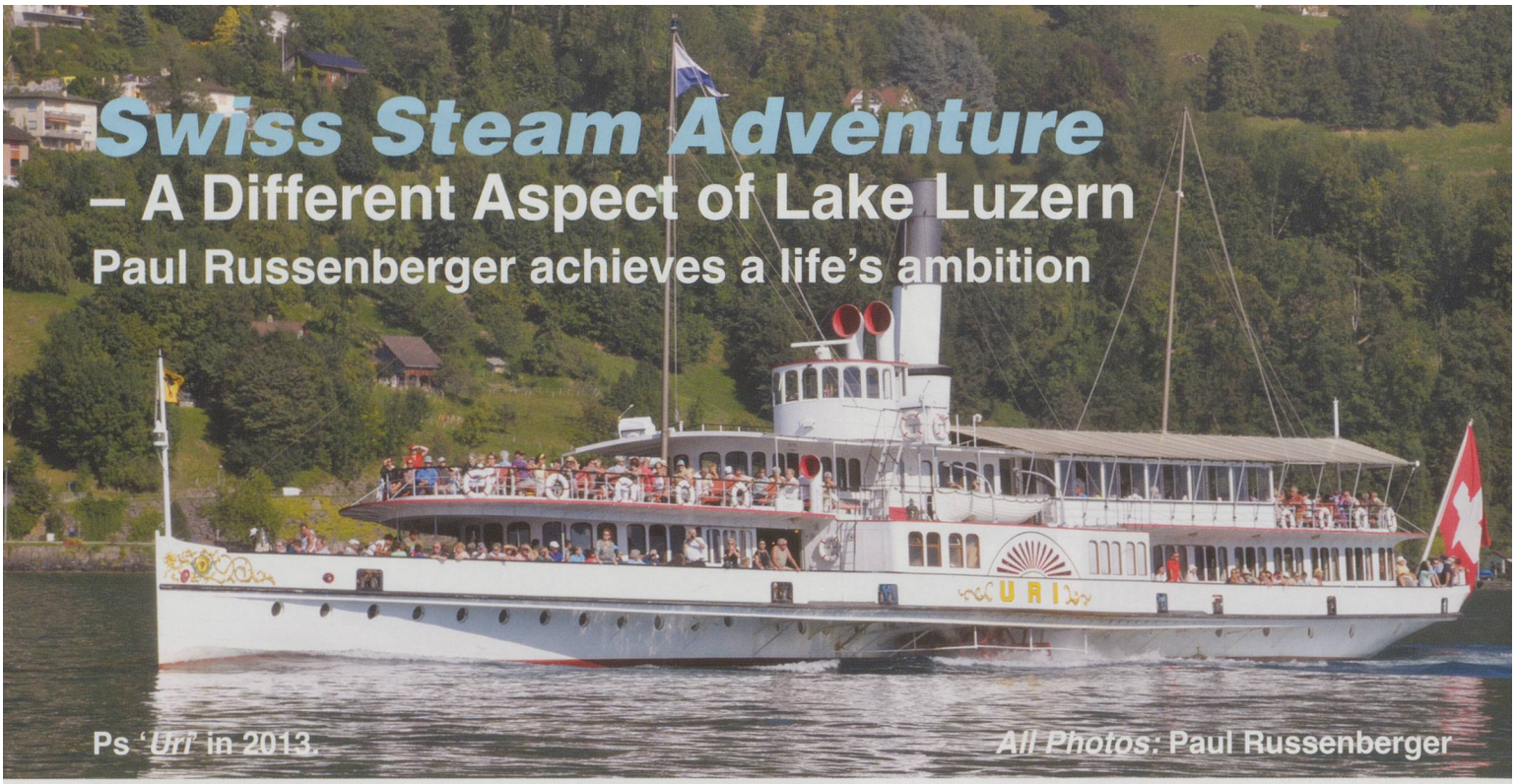
Swiss Steam Adventure
– A Different Aspect of Lake Luzern
Paul Russenberger achieves a life's ambition



Ps '*Uri*' in 2013. *All Photos:* Paul Russenberger

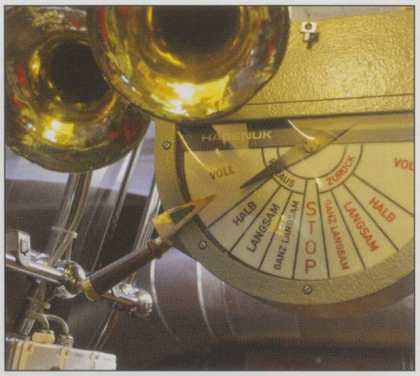
The paddle steamer '*Uri*' had backed away from Flüelen and called at Isleten when, as the culmination of a series of events, that day's Captain, Herr Kallenbach collected me from the forward deck. I followed him to a storeroom where I left my rucksack and donned a British engineman's jacket. He then opened the gate by that tantalising notice 'Entritt Verboten' and led me down the steep ladder into the engine room. Here he introduced me to Herr Sandro Cattaneo, the mechanical engineer who was in charge that day, and for a moment I was speechless. This was a life ambition achieved and I could not think what to say!

Fortunately, Herr Cattaneo broke the silence by giving me a brief introductory tour and then allowing me to examine the machinery for myself, explaining that he usually worked the '*Schiller*' and that he kept her engine room cleaner. Given the condition of the '*Uri*'s' machinery, I could not see how that was possible! Herr Cattaneo was assisted by Herr Mattia Vetter, an electrical engineer.

Herr Vetter watches the telegraph during a stop.

The original engine of 1901 still powers the '*Uri*', although there has clearly been a lot of detailed modernisation. The captain warned me that the engine room would be hot, but it was no warmer than a 'Black 5' on an English summer's day. However, the effect of the vents is noticeable as it becomes distinctly warmer during stops and putting your hand under one reveals a definite cool down draught.

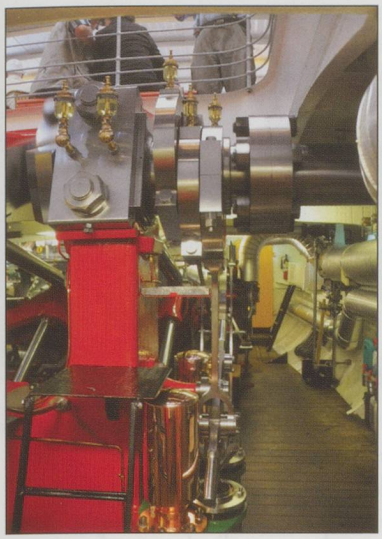
Two oil-fired, fire tube boilers provide superheated steam at a maximum pressure of 12 bar (170 lb/sq in). They are fed with lake water through an electric pump, although an injector is available as a standby. When originally built a feed pump driven by the engine supplied the boilers. Two switches, one for each boiler, enable the oil supply to be increased or decreased and give a fine control. A single gauge glass on each boiler indicates the water level, which was held at 4/5 of a glass for most of the journey. As on a railway locomotive running forwards, opening the regulator lifts the water level. The lake water is sufficiently pure for boiler washouts only to be needed annually, though there are two blow downs daily to remove solids. The insulation on the boilers is sufficient to maintain a pressure of 5 bar overnight, from which a low fire will enable the pressure to be raised to over 9 bar in an hour.



Speaking tube and telegraph to the bridge.

Like most Swiss lake paddle steamers , the '*Uri*' is powered by a 2-cylinder compound engine. A link motion controls steam admission to each cylinder. A single wheel alters the position of both cut-offs simultaneously, but they are not in a fixed ratio. In forward the high-pressure cut-off is always shorter than the low-pressure, but it is the other way round in reverse. Vertically acting piston valves control the high-pressure cylinder, and slide valves, acting on a vertical surface, control the low-pressure cylinder. A

High pressure valve chests.



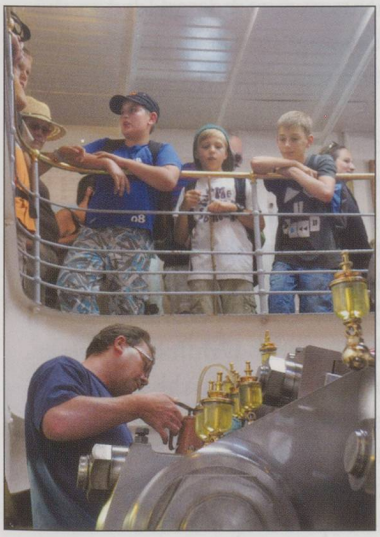
The passageway beside the engine on the starboard side. I was warned to mind the rotating shaft driving the paddle wheels.

drain cock is only provided for the high-pressure cylinder as the slide valve will move away from its acting surface to prevent a hydraulic lock in the low-pressure cylinder should condensation occur.

Unlike a railway locomotive, the *'Uri'* has three regulators. In normal working only the conventional high-pressure regulator is used. A second regulator, labelled 'Hilfsdampf' ['helping steam'], can be opened to admit steam directly to the low-pressure cylinder; in railway terms at least, this is known as 'reinforced compounding.' Since the steamer runs on lake water it has to be returned to the lake as water rather than steam. This is to the advantage of the marine engineer as it requires the exhaust steam from the low-pressure cylinder to be passed to a condenser. Injecting cold water into the exhaust reduces its pressure, which can easily be made to go below atmospheric. This increases the pressure difference across the low-pressure piston, thus increasing the power obtained from the low-pressure cylinder and increasing the efficiency of the engine. The third regulator controls the admission of water to the condenser to maximise the vacuum.

Lubrication points are all over the machinery. The cylinders, which use heavier oil, are mechanically force lubricated. Each cylinder also has a hand operated oil supply, which can be used if the mechanical system fails, though Herr Cattaneo could never recall it being needed. Other bearings are fed from individual oil pots. This produces a 'total loss' system but the oil is drained to a sump below the engine and filtered for reuse. One set of bearings whose lubricating oil cannot be caught are those of the main cranks. As the cranks pass through the bottom point of their rotation they come in contact with a brush which draws off the oil and passes it to the sump, rather than have it run down the side of the crankshaft support. So the engine room floor is kept free of oil. Herr Cattaneo takes advantage of each stop to oil round the engine – he needs to as the machinery consumes 5 litres of lubricating oil each day.

Herr Cattaneo has a young audience as he oils round during a stop.



Approaching a landing stage, the sound of the horn alerts the engine room staff, one of whom moves to the controls and reduces the oil feed to the boilers. Signals are given through a ship's telegraph, though detailed instructions are still given and answered by speaking tube. A second horn for the engine room is sounded by the bridge and the operator responds to indicate that he is on hand. The remainder of the signals are given by the telegraph, control largely being by the high pressure regulator, the operator watching the high and low pressure steam chest gauges as well as condenser vacuum. When the high-pressure regulator is closed the low pressure can briefly go below atmospheric. Once the ship is stationary at a landing stage, the engine will rotate freely to a balanced position.

On the command 'Vorvarts' ['forward'] by the telegraph, the regulator is about one third opened, the cut off having been moved closer to the forward running position already. Here there is a significant difference between a paddle steamer and a locomotive. A paddle steamer cannot slip; consequently, there is no need to start with the valve gear in full forward and ease open the regulator. There is a distinct puffing from the engine as the *'Uri'* gets away from a landing stage and after about a minute the regulator is opened fully and the valve gear moved to the running position of 25% high pressure and 45% low pressure cut-offs. Its position is locked in a similar way to that on a locomotive.

In the engine room you are hardly aware of the movement of the ship at all. I was never aware of encountering the wash of another vessel, though being close to the engine in the centre of the ship I must have been relatively close to the centres of gravity and flotation. Yet the crew seem almost instinctively to know where they are. After a couple of stops I asked where we were to be told 'Treib' in a very matter of fact way. Of course, they do have a copy of the timetable to hand; this is, after all, Switzerland!

Captain Kallenbach at his post on the bridge.

My thanks go to Captain Kallenbach for having me on his vessel, to the operating department of SGV for allowing me toachieve a life ambition and especially to Sandro Cattaneo and Mattia Vetter for trusting me to move freely in their engine room and patiently answering my questions while diligently preforming their duties.

'Uri' steams away from Vitznau in the evening light.