Scottish Curling-Ice Group

ICE KING

Background

An opportunity developed where we would have the rare chance to compare three models of the Ice King powered cutters, with reference to a fourth. The problem for us is that we do not specifically endorse any machine or implement, although we have an established record of analyses and independent opinion. This report provides our thoughts and findings purely for the benefit of whoever might want to read it. We were not paid to do this and seek no reward, we simply wanted to make the best use of a unique opportunity to learn as much as we could.

There are four phases of development to consider. The first is the old cable cutters (and some did manage to cut the cables!), then the Super, more recently the Neo, and now the Monarch. Further background information can be found from files on our website:

Cutting Equipment
Cutting Technique
Essentials of curling ice

1. The cable cutter

These machines were introduced to herald in the new era of powered cutters, which must have been sheer bliss for ice technicians. Using fairly simple technology available at the time, power from a plug in the wall could be used to drive the machine forwards (or backwards), to push a wide blade along the ice and so remove irregularities and smooth the surface. In those days curling ice was not the science it is today, and as long as the ice looked level it was supposed to be level, and the game was after all "the same for both sides". It soon became obvious that a good, sharp blade was essential, and it also became clear that cutting patterns were needed to cut the surface evenly and as accurately as possible. There is a saying in our household that came from a respected man who wished to describe ice conditions at an event, and he said: "some draw, in places, at times". Indeed, cutting in those days was done "in places, at times", because nothing better was required. Water finds its own level, in places at times, even in its solid form!

The machines were not perfect, but they worked well and lasted for very many years. Even today many rinks have one in the back store to use when pebble-cutting after floods, because it would keep going until the job was done – or when the operator ran out of time and energy. With some practice a skilled operator could spin the wheels to change direction and slide the blade into position, hardly even pausing, and with yet more practice the cable could be controlled with a simple kick to slide that too into a new position. To be honest, once you got the hang of it these machines were fun to use.

There were many negatives. The cable was always a nuisance, not only because of safety concerns (although it is quite impossible to cut the cable if the blade is always on the ice), but mainly because of the snow it scattered. The variable-drive pulleys did not always behave themselves and could be a real test to adjust, and a serious test to replace. The wheels were loaded with liquid and antifreeze to provide the weight for traction, which made the machine very heavy and difficult to turn, causing sore hips and backs after a year or so. Lifting the blade off the ice to move the machine to somewhere else could be a challenge, especially along the confined spaces of walkways. In short, for a powered cutter, the biggest problem was the power itself, the cable and the drive mechanism.

On the plus side it must be said that these machines were well made, strong and durable, and they helped to change curling ice for the better, forever. The problem really was the blade, usually blunt and imperfect, requiring weights in the box and also precariously balanced on top of the box, simply to be able to scrape the surface after a fashion. Although things have changed for the better, it is no surprise that the technicians of the day called these machines scrapers. But don't blame the machine for the blade, the machine worked very well.

For all technicians the bottom line is the same: use what you have, there is nothing else. Problems did not go away, they had to be identified and overcome. We all found that the cutting patterns we were using did not work too well, and with the limitations of the cable cutter it was difficult to experiment and learn. For us there began a period of many years' research into every aspect of curling ice, from water to equipment, and for this the cable cutter was simply not good enough. Curling ice was becoming a scientific challenge towards perfection.

Fortunately a friend and mentor in curling ice mentioned that a new machine was now available, and it ran on battery power. Ice King made it, and it cost a fortune.

The Super

At the time my employers were not going to buy me anything, let alone a new cutter, so I had to buy it myself. This I did with savings and borrowings, and my new Super duly arrived. As with most new things there were problems that needed to be addressed, which in this case centered around the batteries and charger. Fortunately the agent in Scotland knew quite a bit about electricity and soon came up with the solutions, caused mainly by variations between Canadian and British electrics, and within the month my Super was running smoothly, fully charged every day.

It was sheer heaven. The machine danced along in a straight line and turned with a finger, smoothly and evenly. It was light but strong, manoeuvrable and accurate. It worked, and the fact that there would be no family holidays for a few years to pay for it was quickly forgotten. I looked forward to cutting the ice every day and enjoyed the job, and I was proud to be the owner of an Ice King Super.

As our research continued there were many lessons to be learned. In order to have a perfectly level ice pad we had to learn how to install it, because no machine could cut it level. But once level, it could be kept that way, with even and consistent pebbling, cutting and adjustments according to usage. To develop our cutting patterns I experimented with different depths of cutting, eventually settling on a light shave rather than a heavy plough, using some eighteen passes per sheet every day to remove virtually all the previous day's pebble. The Super could do that on one charge, but only just, in about fifty minutes of continuous cutting – this was clearly as good as it was going to get. For extended cutting after floods I had a spare set of batteries, which doubled the time, but by then I was tired anyway and happy to call it a day.

At this stage the blades were becoming a problem. It was virtually impossible to have a blade reground to within the stated tolerances of "a thou' of an inch", and it was equally impossible to hone it into true shape unless the tolerances had been observed. Send a blade away and it was a gamble on the return. At a small course for ice technicians I listened to Shorty Jenkins as he explained what was involved, and saw the blade that he considered "was getting there", and two years later I tracked down the man who had ground that very blade. After a full day in his workshop he showed me how he did it, as he was doing my blade, and for once I had a good blade. Others were sending their blades to Ice King, but for me the cost and complexity of delivery and collection killed that option. Yet even now I was still receiving blades that were simply not good enough, mainly because the engineers we were working with had apprentices who simply did not understand our requirements. We had advanced into the realm of perfection, while they were still catching up. But progress was made, the blades were better and better, braces came into use to correct the problem of uneven temperatures in the blade assembly, honing stones were more consistent and, as a whole, blades were no longer too much of a problem.

This was a major step forward in curling ice. From scraping the hell out of the surface with a cable cutter we were now caressing a level slab and gently shaving off the pebble, and with the Super this was a daily exercise of pleasure. Now we could start experimenting with pebble sizes and distribution, temperatures and other parameters, simply because it was easy to remove the pebble and start again, over and over, until we found what worked best. The Super made it possible because it was so easy to use, so accurate and consistent, enabling us to work on a chosen sheet for hours on end until we reached our conclusions. And my sore back was never sore again! Cutting ice was no longer a case of using what we had, it was using what we wanted and needed.

To create some real perspective, recall the decade of 2000-2010. Computers existed, but were slow, and needed constant upgrades to keep up with the advances. The internet was slow, and for many still non-existent, but by the end of that decade broadband was becoming the norm. Progress was rapid and in fast acceleration, both for computers and the internet, not to mention the rest. Throughout those years we were all using Ice King Supers and, because of the quality and reliability of the machines, we were also able to make rapid advances in our research. Curling ice became scientific, new standards were set and achieved,

and today virtually every technician has full and open access to all the information they might need, mostly via the internet. At the beginning of that decade this was not even a dream, it simply did not exist, and just look at it now.

The Supers fell victim to these advances primarily because the batteries could not supply sufficient power to deal with larger rinks and of course arenas. Anyone with a six sheeter only had the same cutting time as the man with a four sheeter, yet he had to do 50% more work. While my colleagues and I were very happy to keep using the Supers, others were forced to look for something better. At around the same time, word was reaching us that Ice King was in trouble and would "go broke". We don't do politics or high finance so I can't comment on that, but we did receive assurances that all would be well and, as the days passed, this was confirmed.

Would Ice King be able to pick themselves up and meet the challenge of new competition, new technology, new developments, simply because larger facilities needed more power, larger batteries, longer cutting time? We simply had to wait and see. The challenge must not be underestimated, it takes time and money and serious dedication to make such a transition, which is essentially from something that worked perfectly well to something that had to be created virtually from scratch – to work even better.

The Neo

First impressions were very good and positive, with one big "but". It was heavy, very heavy, and so heavy that there was no need to charge the wheels with water and antifreeze. The reason was primarily the batteries, which were enormous, and there were two of them. On the bright side these batteries lasted for many hours without a recharge, enabling virtually unlimited cutting time.

We, like many technicians, had become accustomed to lift the blade off the ice when needed, to avoid bruising the pebble or damaging the cutting edge during turns. Because of the weight this was now impossible, but the machine had been fitted with an electric actuator to raise and lower the blade assembly at the push of a button. Whilst it overcame the problem, it took time, and we simply had to learn a new way of doing things. The machine had also been fitted with another actuator that could angle the blade either way, also simply at the push of a button. Unfortunately the angle had to be judged by eye, for there was no indication of whether the blade was straight or angled at whatever degrees. This was not too much of a problem, but took some getting used to.

Again, as with many new things, there were problems to deal with. The wiring was clearly substandard, a bit of a rat's nest, begging to cause a problem. It did, and had to be dealt with. The charger too decided not to work and that had to be replaced, after which everything electrical worked well. But it was clear to us that the charger had been "glued to the side" for somewhere to put it. We later learnt that none of these problems had been of Ice King's making and could clearly be traced to less than proficient subcontractors.

Built into the system of electrics and electronics are sophisticated safety features. In this modern era of computers and clever gadgets this was not unexpected, but a little time had to be spent studying the instruction manual to learn what was allowed or not allowed. Like a modern car these things are not for the novice mechanic, if something doesn't work or ceases to work repairs are not really an option, the faulty unit is simply whipped out and replaced. Of course this is not ideal, but usually nothing should develop a problem and if something does, it is not difficult to deal with.

We did not like the switches, or the layout, for the actuators, throttle lever and safety handle. The throttle was jerky and unresponsive, which took some getting used to. We did like the finer thread on the blade-pitch adjuster, giving a more accurate result. We could not come to terms with the blade guard, which was nothing but a nuisance. The hood was heavy (caused partly by the charger) and awkward. Visibility over the hood was better, but still not ideal. In all the machine looked the part and was well made, but there was some hesitation before we could call it excellent.

Using the machine was not too much of a problem, it did the job well and in many ways was an improvement on the Super. It was fast, powerful, sensitive to direction and durable beyond the energy of the operator. As with all cutters tyre pressure had to be low and balanced, or the power would simply cause the wheel(s) to spin or pull off line. Due to the extra front weight of a new blade (with more metal and so heavier), there was no need for additional weights inserted in the box, although many technicians would be ploughing pebble more than we do and would still need the weights.

Compared to the Super, the Neo was certainly new. The same robust construction was clear to see, but many aspects had been simplified and many had been greatly improved. While, at first, it was very different to use, it soon came into its own with the new features and worked very well. Was it better than the Super? Without a doubt it was much better. However, it was clearly very much a job in progress and could be improved upon in many little ways to perfect the product. Taking into account the problems facing Ice King during the development phase of this machine, we would again simply have to wait and see what the next machine would be like.

The Monarch

In a sense, this is what the whole exercise has been about, the result of several years' development to produce a fine machine. It was well worth the wait.

First impressions were of a machine that looked the part, sleek, clean, solid, even beautiful. The charger had been moved to inside the hood and the wiring had been simplified, giving a compact area of activity out of sight and out of harm's way. The small changes in weight distribution provided excellent balance, and it was in fact easier to lift the blade assembly off the ice than with the Neo. Manoeuvrability was superb and very light, and delivery of power to the wheels was smooth and even. The new throttle lever worked very well and in all the machine was a joy to use.

Of course, there are things that can be improved, as there always will be, but they are small. The most troublesome item is the safety lever, which runs the length of the handlebar. Ice technicians work in cold temperatures and most will wear fairly bulky clothing and usually gloves too, and any clothing can easily catch on the ends of this lever. The positioning of the switch for the vertical actuator, on top of the handle frame beyond the bar, requires the technician to reach past the safety lever with very little room to spare, and it doesn't take much to catch the end of the safety lever. The safety lever on the Super did not have this problem, and we all preferred it to the new version.

The switches for the actuators too can be improved, placing the horizontal switch near the position of the left thumb, and the vertical switch near the position of the right thumb, more or less beside each other with the one switch horizontally and the other vertically. These will be much easier to use and avoid the problem of clothing.

Lifting the cover to access the inside can be improved too by adding a simple handle, or one on each side, to the rear of the box. The cover is heavy and lifting it safely with gloves is not very easy.

There is no point in trying to find things to say about the Monarch. The small items we can criticise have been mentioned, and they are very small. For the rest we have to stand back and take a long, hard look at the big picture, from the cable cutters through to the Monarch. For decades Ice King have produced cutting machines that were well built and up to scratch, and the Monarch is without a doubt the best machine they have ever produced. It is well suited to the modern era, up to date, well designed and engineered, and fit for anyone who needs to cut ice on a daily or even hourly basis.

Please, can we have one?

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