

Date: Fri, Feb 12, 2010 at 6:39 PM

Subject: Scholes cabin 5 (p): B15K crashes into Atka!

Dear Stirling,

Early last evening, that giant fragment of wandering iceshelf called B15K finally ploughed into the ice shelf just west of Atka Bukta. I did not see it, but they say a plume of snow and ice about 40 m high shot up. The researchers at Neumayer had planted some microphones in the ice, and they heard the crunch. The helicopter pilots reported a new crack in the ice shelf, which may be a result of the impact. As a result we hurriedly aborted loading operations and scuttled back to sea. But we are back at the shelf again today, trying to finish off so we can leave for Cape Town tonight.

If you remember, B15 broke off from the Ross iceshelf nearly a decade ago, and has been bumping and grinding its way around the continent ever since. A big sliver called B15K was lying in front of Penguin Bukta for several months. It finally swung loose and zoomed (in relative terms) across the few hundred kilometres between there and here, before colliding with the shelf again last night.

The captain estimates that it weighs fifty billion tonnes. We can check that calculation roughly: it is more-or-less rectangular, 50 km long by 5 wide, and about 250 m thick. That gives a volume of 62.5×10^9 cubic meters. Since a cubic meter of ice weighs about 0.8 of a tonne, he is in the right order of magnitude. He also estimates that it was moving at 0.5 knots when it struck. That is about 0.26 m/s (check my sums!). The kinetic energy in a body of mass M moving at velocity V is given by $E = \frac{1}{2} MV^2$. The units from mass in this case are kilograms, so $E = \frac{1}{2} (M \cdot 1000) \cdot 0.26 \cdot 0.26 = 1.65 \times 10^{12}$ Joules or 1.65 billion kilojoules.

How much energy is that? Well, one of Eskom's giant power stations generates 3600 MW, and a MW is a million Joules per second. So the energy in that impact was the equivalent of 7.6 minutes (check my sums!) of output of one of those power stations, going full steam! That is enough to crack some ice.

But not enough, I hope, to keep me from setting off for home tonight.

Love,

Dad