

Subject: My Dan Osman Rope Failure Analysis

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Newsgroups: rec.climbing

Date: Fri, 16 Jul 1999 12:09:11 -0600

I think it is time I spoke up publicly. I have reviewed Dano's rope in some detail. My findings and theory support those published by Kevin Worrall in Climbing (No 183, March 1999, Pg 90).

This statement is mine personally and NOT that of Black Diamond Equipment!

This is obvious as you read below.

Irrelevant Background:

I am a Materials Engineer with BS degrees in Physics and Materials Engineering and a ME in Materials Engineering (I nearly finished a PhD but bailed once I learned I did not enjoy being a scientist any longer). I know lots about atomic layer semiconductor crystal growth. I have been the Quality Assurance Manager for Black Diamond Equipment for 6 years. My primary responsibility is the testing and analysis of climbing equipment, among other stuff. I have been involved in the ASTM climbing and mountaineering standards development for the last 4 years. I investigate all accidents I hear of involving equipment failure, whether they are BD's or not. I review rec.climbing every day looking specifically for posts related to accidents, gear, misuses of gear, issues about BD, etc. I, and others at BD, go out of our way on this news group to publish information above and beyond what is required by the standards that climbing gear is designed to (see the recent lame thread on "Gear Safety" which I will not respond to specifically. See Karl Lew's web site. Search under my name on dejanews for examples). I do not post to this news group as a general rule unless I think that posts from various people are specifically wrong or misleading, as is the current case (in fact I try to avoid posting because of commercial conflict of interest). I respond to individuals on this news group constantly and my comments to these people come back into this group (see the current RP thread on soldering cable fatigue). I respond in detail to individuals who ask me questions, even when they do not like what BD is about (see recent Camelot threads and failure analysis associated with this thread).

Even more irrelevant background:

I have been rock climbing since 1981, and am primarily a trad climber. I am a risk taker because I climb. Climbing IS dangerous and anyone who thinks otherwise is fooling themselves. Anyone who climbs is a risk taker in my opinion. I climb 5.12 on any rock type (that I have been on) and style (except offwidth, so far) and have onsighted up to 12c/d. I climb WI6 and possibly harder (ice is either hard or easy to me and is my primary passion). I climb M8. I establish new rock, ice and mixed routes ground up with and without bolts. I have no aid or alpine experience. I weight 190 lbs and take upside-down 40 to 60 footers without my helmet on. I have nearly killed myself several times due to falling off 5.8. I am a climber, climbing eventually involves falling, which may very well kill or maim me. Most people, including myself, would consider me to be reckless because of how I climb. I climb for my own reasons and no one else's. I don't care what people think about me in general. Why Dano jumped off cliffs is his own personal choice that nobody has a right to argue against, even if he had children in my opinion. I certainly have no right to judge his reasons for doing what he did. I respect Dano for pushing the limits way way beyond where they had been previously. I met Dano twice but did not know him. I know many of his friends.

Relevant Background:

My expertise in the analysis of broken climbing ropes is very limited. This is due to the fact that climbing ropes very rarely break or cut in

actual use. The only previous experience I have with rope failure analysis was that of Matt Baxter who died on El Cap several years ago when his rope was cut by a flake after a carabiner had broken (see dejanews for more info on this, send a Freedom of Information Request to the NPS-I recommend you do it for the Dano accident as well and then you can have a copy of my official report, or look at ANAM). I have also reviewed several ropes with sheaths shredded due to the open back regular carabiner gates in minor axis. This lack of experience could indicate that my findings are incorrect or suspect.

I first became involved in Dano's accident when news of Dano's death spread across this news group with the associated rumors that the NPS might have purposely cut his rope. On December 9, 1998 I sent an email to John Dill (YOSAR director) letting him know of these rumors on this news group and offered my assistance in the analysis of Dano's equipment. John responded back that Yosemite Law Enforcement (YLE) was investigating the accident and that they had to finish their investigation before I might be able to see the ropes (they too knew of the rumors of murder and were investigating this as well I suspect). As you all should know Dan's ropes stayed on the wall for over a month and YLE was unable to recover them. Given the rumors of tampering by the NPS a climber took matters into his own hands. He recovered the ropes and sent them directly to BD. As soon as I received the ropes I contacted YLE because I was in possession of stolen federal evidence from an active investigation. I was told to return the ropes immediately and reveal the name of the person who sent me the ropes. While on the phone with the lead investigator another phone call came into BD from "someone within YLE" stating that the FBI would be at BD to arrest me if I did not send the ropes back the next day. I was freaking out to say the least. Meanwhile I looked at the rope in some detail. It was melted through. It looked as if there were the possibility that someone had hot cut the rope. When I called YLE back and told them this they wanted me to conduct my full investigation and allowed me to keep the rope for two weeks. No FBI showed up to haul me away.

Analysis:

I only saw the one section of rope that was cut down and contained the failure point. I did not see the rigging, retrieval rope, or the section that was attached to Dan directly.

Everything I did was visual examination. I did not untie any knot or tamper with the rope in any way other than prying the knots to see inside. With some insight from Doug Heinrich I concluded that the failure of Dan's rope was not due to tensile overload or from being tampered with. I strongly believe that Dan did miscalculate on his last jump. For some reason he moved his jump site. In doing so he crossed the ropes (either on the retrieval line or on the main jump line). When he jumped the first knot above the one he was tied in with slid down a section of rope several lengths up. The sheath was heavily melted and removed in several sections on this upper part of the rope. The knot that slid down the rope was melted in multiple locations and was melted nearly completely through, deep inside the knot. This knot was not tight, yet others in the system were (this is the one open question that is unresolved as far as I know). It is my conclusion that Dan's rope was cut by his own rope sliding against itself. Use of a magnifying glass indicated to me that the cut surface was due to sliding action in one direction. There was no evidence of hot cutting with a knife or other type of instrument. I conducted further experiments in my lab to see if tensile overload could have caused this failure. The samples I tested were significantly different in that they were heavily frayed and tattered. My analysis of Dan's ropes in general was that they were in great condition. There was no evidence to me of damage due to previous falls, uv exposure, or weather. I would have climbed on these ropes without any hesitation had they not been from this accident. I do not believe that the condition of the ropes had anything

at all to do with the failure of the ropes. Nor do I believe that Dan's basic shock absorbing setup was incorrect. Crossing the ropes was the problem.

I was asked by YLE not to make my findings public until they had finished their criminal investigation. They forced me to tell them who sent me the rope and they pressed charges against this individual (I will have to live with the fact that I was unable to keep this information confidential). I still have not heard back from YLE about closure of this accident and decided to make my findings public now due to the vast numbers of misinformed posts relative to this subject. Maybe my analysis will stop some of the useless bickering many of you are currently engaged in.

Conclusions:

What is to be learned from this accident? NEVER LET NYLON SLIDE AGAINST NYLON! You should already know this.

I also know that Dano's rigging setup was reviewed by more than a couple of technically competent people. I also know that he tested it multiple times. I personally do not think that what Dan was doing (when done properly as he had done on earlier jumps) was any more dangerous than modern ice climbers doing hard thin ice routes (like in Maple Canyon and elsewhere), in fact his setup was most likely safer in my personal opinion. Dan's death was a tragedy and an accident.

Again, this summary is mine personally and not that of Black Diamond.

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