

Ramsey to Oppenheimer, August 1945, Secret, excerpt:

.... Our experience in the delivery of the fat man has convinced almost all of us of the importance of one much needed improvement. It is in my opinion essential that any atomic bomb to be used in any fair quantity must be capable of being completely protected against even a slight possibility of a nuclear explosion being detonated by fire in take off of the aircraft. This will be particularly true later when atomic bombs are available in sufficient quantity that one can not safely gamble the safety of the base on merely the low probability of a fire on a single takeoff and when one can afford even a small loss of reliability to ensure the protection of the home base. Only twice since I have been here have I been even slightly worried or nervous but both of these times the intensity of my worry made up for the relative calm of the other periods. One of the bad times was during the two hour interval between the scheduled time of the report from Ashworth on the Nagasaki raid and the time of the actual report. However, the worst period was that between the time the B-29 engines with the fat man were cranked up and the time the plan was well clear of the island. The night before the takeoff four planes in succession crashed in takeoff at the other end of the island—in fact the situation got so bad a mission of 100 planes was cancelled after only 30 got off the ground. Since I have been here I have watched several fires resulting from crashes. By actual timing a very intense gasoline fire continues for over twenty minutes. Six of eight fire engines working on such a fire don't even make a dent. After witnessing such fires and after having sweated out one FM [Fat Man] atomic bomb take off, I can't urge too strongly the importance of complete nuclear safety in take off for future models. The only sure ways I have been able to think of is a trap door model with a cylindrical plug through the HE [high explosive] so that the active material can be inserted in flight or the insertion of neutral material in the open space of a non-Christy [model?].¹ I realize the difficulty of this especially with a non-Christy model. However, I feel that this feature is so important that with future great abundance of active material even a loss in efficiency and reliability to achieve it is justified. The one FM take off has been my most unpleasant experience since joining the project.

I also think that serious thought should be given to the means whereby from now on the United States can remain in a state of readiness in which an atomic bomb could be delivered to any place in the world on a moments notice. To establish a base similar to our present one at Tinian would take a long time. My own preference would be to have the main base in the United States with all equipment necessary for establishing a forward base being airtransportable and being held in reserve along with the necessary air transports at the U.S. base. This would be especially applicable if the units could be made completely safe against a possible nuclear explosion resulting from a crash. In this case I would strongly recommend assembly and loading at the U.S. base with only staging occurring at the advanced base. As more material becomes available we could afford a sacrifice in reliability to achieve this and could even avoid the need for a loading pit² at the advanced base by having all planes including the spare ones carry units.

LeMay and Tibbets have been proposing some post war Air Force proposals to send to Eaker. You'd better make sure that there are properly coordinated with future bomb development plans before the Air Force goes too far. At present their proposals (which I believe have not yet been sent in) call for the establishment of an atomic bomb wing based in the Palm Springs-Victorville area and capable of delivering atomic bombs to any place in the world. This location would be all right if Y³ moves to Pasadena but I at least have heard nothing official on such a move. I suggest that you watch out that the tail does not wag the dog and that the future location of Project Y is not determined by an Air Force action.

I am sure by now that you have heard the full story on the Hiroshima mission, but in case you have not been fully informed about the Nagasaki one, I shall summarize it. Our original schedule called for take off on the morning of 11 August local time (10 August Washington time). However on the evening of 7 August we concluded that we could safely move the date to 10 August. When we proposed this to Tibbets he said it was too bad we could not advance the date still another day since good weather was forecast for 9 August with at least five days of bad weather forecast to follow. We agreed to try with the understanding we might miss our schedule since we were unwilling to speed any operation which might conceivably affect either safety or reliability. Finally at 11 PM on August 8 the unit was in the plane and completely & thoroughly checked out. Take off was at about 300 AM. We all aged ten years until the plane cleared the Island. We were scheduled to receive a strike report at 10:30 AM 9 August, but all we had until 1230 was very the very worried query from the fastax ship⁴, "Did the strike plane abort?" Finally we received the message from Ashworth that the secondary target had been bombed largely by radar and that at least technically the unit functioned even better than Hiroshima although there was some doubt as to the location of the bomb. We learned later that the strike plane had its first trouble in making its rendezvous with the fastax plan. Although it was supposed to wait not over fifteen minutes at the rendezvous point at the coast of Japan it kept seeing approaching B-29's on another mission each one of which it would think initially was the fastax plane. In this way the strike plane actually lost 50 minutes. It then made three attempts to bomb the primary target, but on each occasion a cloud interfered. This took another fifty minutes. As its fuel was then getting lower it then went to Nagasaki, making a necessary shortcut which carried it over enemy territory most of the way instead of over the usual water routes. It was then clear that there was enough gas for only one run and not enough gas to carry the unit on to Okinawa (Iwo [Jima] was closed in with bad weather). It was therefore decided to drop either by radar or visually. A radar run was made in the course of which the bombardier got one visual check. The bomb was released & hit apparently approximately over the Mitsubishi steel works. However, it was days later before the weather cleared enough for good photo recon pictures to be taken so that we could learn what a really lucky shot it was. The drop was far away from the aiming point but was at probably an even better position than the aiming point since at the time of the selection of the aiming point it was not certain that the extent of the destruction would be as good as that actually obtained. The bomb apparently detonated somewhat north of the Mitsubishi Steel and Arms Works. All other factories and buildings on the Urahama River from the Nakajima Gawa River through the Mitsubishi Urahama Ordnance Plant were destroyed. The distance from the northernmost

factory that was destroyed to the southern boundary of complete destruction was about three miles and damage might have occurred north of the Urahama Ordnance Plant if any buildings had been there. Although only 44% of the city was destroyed by the official record this is due to the unfavorable shape of the city and not to the location of the bomb detonation. The most conspicuously factory section of the city was the section destroyed. Good pressure records were obtained on the mission and copies of these curves are being forwarded to you by Alvarez. No fastax pictures were obtained due to the failure of that plane to make its rendezvous. The fastax film from Hiroshima is being forwarded by Waldman for further study at Y. A complete set of photo recon pictures of both Hiroshima and Nagasaki before and after the strike is being forwarded to you by Baker (directly I hope but Kirkpatrick may insist that you set go through Groves first). That Nagasaki picture is of very poor quality since the original negative is now in Washington. The extent of the damage is much clearer on prints made from the original negative.

I think that on the whole things have gone remarkably well. Up to 19 August this was the most successful and best managed field party that I have ever seen or heard of. Everyone did a really excellent job and the whole organization worked beautifully as a unit. Unfortunately, the orders requiring us to stop⁵ on after 20 August made a bad anti-climax. However, since then we have tried to make the best of a sad situation. I hope that you can do something to get us home. Everyone deserves at least this much of a reward.

Notes

¹ . Robert Frederick Christy was a member of the Los Alamos Theoretical Division's Implosion Dynamics Group who developed crucial design concepts for the Fat Man implosion weapon. See Norris, *Racing to the Finish*, 364.

² . The bombs were loaded into the bomb bay from a pit in the ground.

³ . Los Alamos laboratory

⁴ . Aircraft with high-speed cameras.

⁵ . Presumably an order to stop assembly work on weapons.