

The First Atomic Stockpile Requirements (September 1945)

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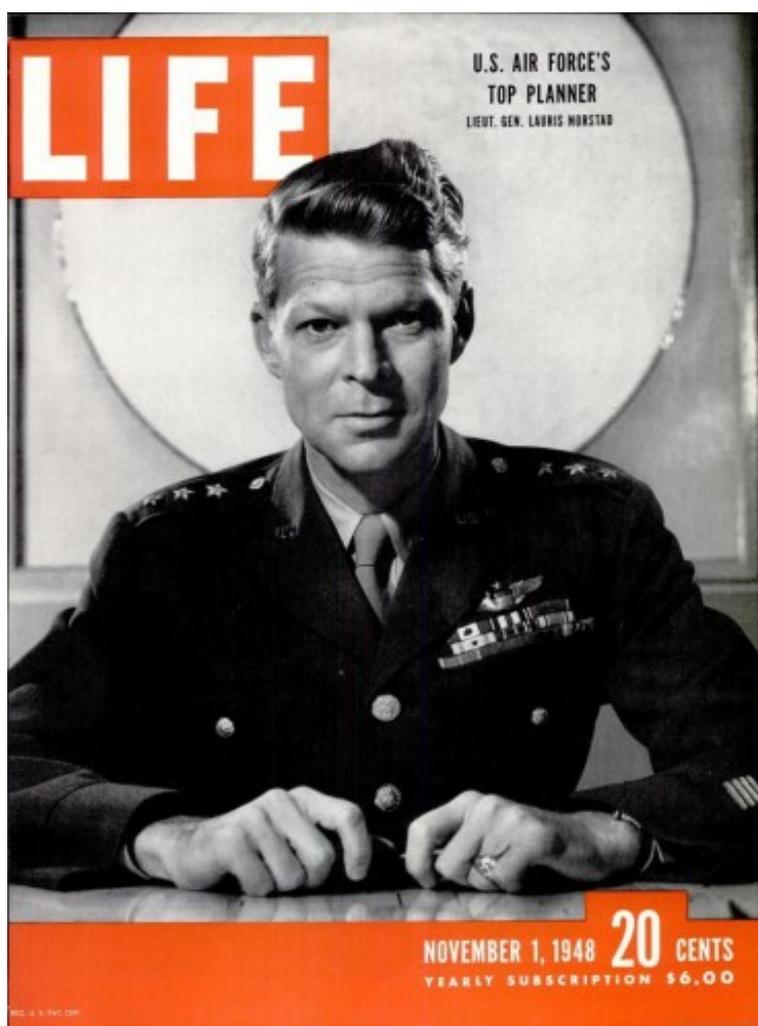
The question of *how large the American nuclear stockpile should be* has long been a controversial one. Usually it is argued out as a question of *how many nukes do we need to be safe?*, where "safe" here means, "to make sure nobody wants to nuke us first," i.e., *deterrence*.

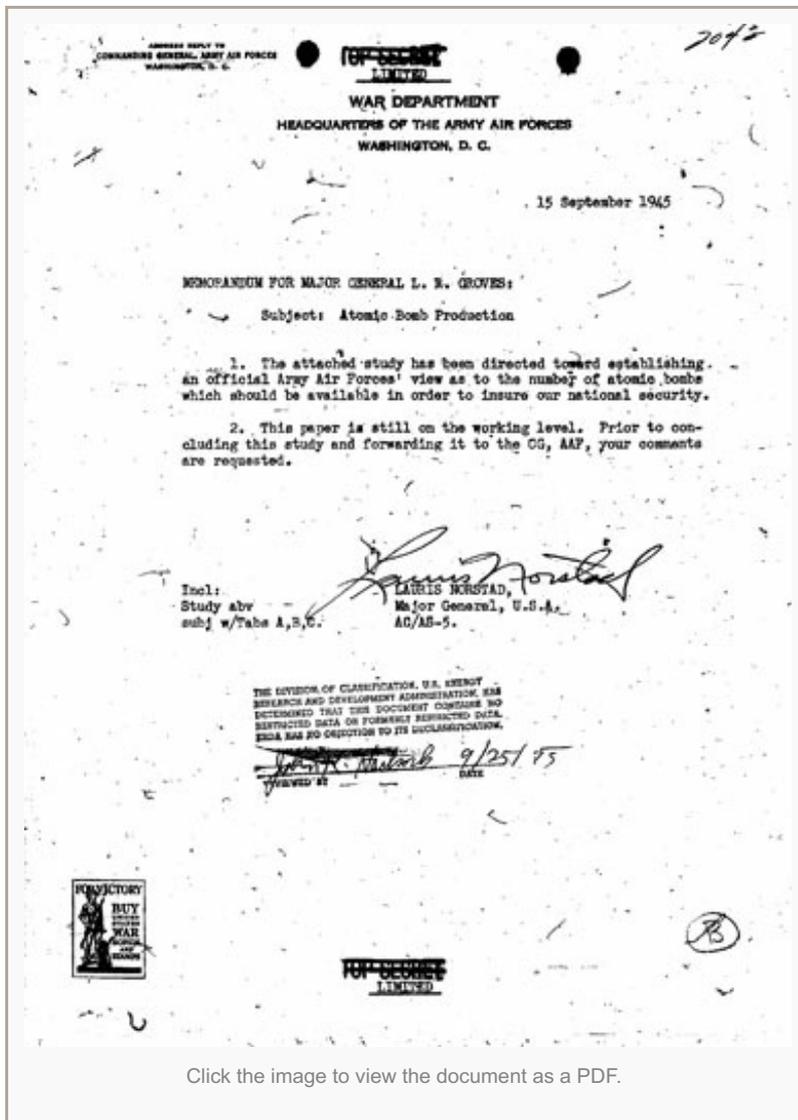
It's a fair enough question, although, as my readers all surely know, there are many sides to how one should pose it.

But for the Weekly Document, let's go back to an *earlier time*. Today, I want to look closely at the *very first* attempt at coming up with a *systematic estimate* for how many nuclear weapons the United States should ideally have. This was completed in early September 1945 — well before *nuclear* deterrence was on the table, for at this point the United States still had a literal monopoly on nuclear arms.

The architect of this estimate appears to have been Major General **Lauris Norstad** of the US Army Air Forces (USAAF). Norstad would later go on to be one of the top Air Force planners, and later the Supreme Allied Commander Europe for NATO, but at this junction he was high-ranking staff at the USAAF headquarters in Washington, DC.

On September 15, 1945 — just under two weeks after the formal surrender of Japan and the end of World War II — Norstad sent a copy of the estimate to General Leslie Groves, still the head of the Manhattan Project, and the guy who, for the short term anyway, would be in charge of producing whatever bombs the USAAF might want. As you might guess, the classification on this document was high: "TOP SECRET LIMITED," which was about as high as it went during World War II. (That the report came with an [attached map](#) showing projected US atomic capabilities in the USSR probably didn't help with that.)¹





Let's cut to the chase. How many bombs did the USAAF request of the atomic general, when there were [maybe one](#), [maybe two](#) bombs worth of fissile material on hand? **At a *minimum* they wanted 123. Ideally, they'd like 466.** This is just a little over a month after the bombings of Hiroshima and Nagasaki.

Of course, in true bureaucratic fashion, they provided a handy-dandy chart:

18. In summary, it is computed that the United States requirements for stocks of atomic bombs are as follows:

<u>Minimum</u>		<u>Optimum</u>	
For incapacitation of 15 first priority targets -	39	For destruction of 66 cities of strategic importance -	204
For neutralization of possible enemy bases in the Western Hemisphere -	10	For neutralization of possible enemy bases in the Western Hemisphere -	10
For Strategic isolation of the battlefield -	<u>10</u>	For Strategic isolation of the battlefield -	<u>10</u>
Total	59	Total	224
Probable effectiveness factor -	48%	Probable effectiveness factor -	48%
Minimum requirement = $59 \div .48$ or		Optimum requirement = $224 \div .48$ or	
<u>123</u> bombs		<u>466</u> bombs	

CONCLUSIONS

19. It is concluded that the United States has a requirement for a minimum M-Day stock of 123 atomic bombs and an optimum stock of 466 atomic bombs.

Click to enlarge (the image, not the stockpile). I wonder whether anybody would buy a mug with this on it.

Let's parse that out. The left column is the *minimum*, the right is the *optimum*. The purpose of the requirement is "**M-Day**," defined in the report as the day in which the US would be desiring to be capable of "**desirous of immediately crippling the ability of the enemy to wage war.**" This "M-Day" force would need to be capable "of being employed immediately upon initiation of hostilities and the estimated quantities of bombs required must be available at that time."

In other words, M-Day is a first-strike attack by the United States — a nuclear knock-out punch designed to beat another nation immediately into the stone age. "There has been no attempt to estimate the quantity of atomic bombs which would be required to conduct a prolonged war of attrition," the paper continues. Oy, that's an idea.

And, of course, it isn't just "any other nation." The analysis quickly fesses up to the fact that the only nation they're concerned about is Russia, because they're the only one who is projected to be even remotely on par with the United States from a military point of view for the next decade. "For the purpose of this study the destruction of the Russian capability to wage war has therefore been used as a basis upon which to predicate the United States, atomic bomb requirements."

For the "minimum" strike, there are "**15 first priority targets**," and for the "optimum" strike, there are "**66 cities of strategic importance.**" Amazingly, these planners have decided that you need **around three nukes per city** to really destroy them.

And "really destroy them" is not too far from the language in the plan: "**The primary objective for the application of the atomic bomb is manifestly the simultaneous destruction of these fifteen first priority targets.**" They don't weasel around with euphemisms, do they? Later in the report, it describes the possibility of a back-and-forth nuclear exchange as "**a mammoth slug-fest.**"

Here is the list of the **15 priority targets**, in order of priority: Moscow, Baku, Novosibirsk, Gorki, Sverdlovsk, Chelyabinsk, Omsk, Kuybyshev, Kazan, Saratov, Molotov, Magnitogorsk, Grozny, Stalinsk, and Nizhny Tagil. You might wonder why Baku is on there and, say, Leningrad is not. The priority targets are based largely on important **industrial output**; Baku was responsible for 61% of all Soviet crude oil output, 49% of oil refining, and 15% of steel output. Leningrad, at that point, was responsible for far fewer things.

The full map of the 66 Soviet targets — and 21 Manchurian targets (which they decided weren't of a high enough

priority to worry about right now, but they did map them — is here:



(I've uploaded a reasonably high resolution file here — with some heavy JPEG compression to keep the file size as small as I could; if for some reason you need it in the ultimate, maximum, uncompressed size — some 20MB or so — get in touch. Note that this is a stitch of six different microfilm scans, and the alignment isn't perfect. So if you see weird artifacts of that... well, that's what it is. Should you desire this map on a mug, there are [ways of making it happen.](#))

What the map really underscores is the methodology. **It's about industrial, war-making capacity, not just population or cultural importance.** That is, when they say "strategic," here, they still mean it in the World War II sense, not the Cold War, "strategic as deterrence" sense. They aren't planning on deterrence, here. They're planning for destruction.

Back to the plan: The only differences between the "minimum" and "optimum" plan are the total number of cities targeted. At three-ish bombs apiece, that 39 for the "minimum," 204 for the "optimum."

Both estimates also include **10 bombs** for the "**neutralization of possible enemy bases in the Western hemisphere**" — the report explains that this is in case the USSR grabs a few other bases in the meantime that might be within shooting distance of US bases. It doesn't elaborate. Let's imagine that at least one of them is in West Germany, since the Soviets rolling westward is the common military scenario from this period. (**Note:** After writing this, a friendly reader wrote in to point out that the official definition of the "Western hemisphere" does not include West Germany at all. It's actually [considerably to the West](#) of most of Europe. Was the idea that the USSR would roll across France and Spain as well? That they would somehow land in North or South America? I don't know.)

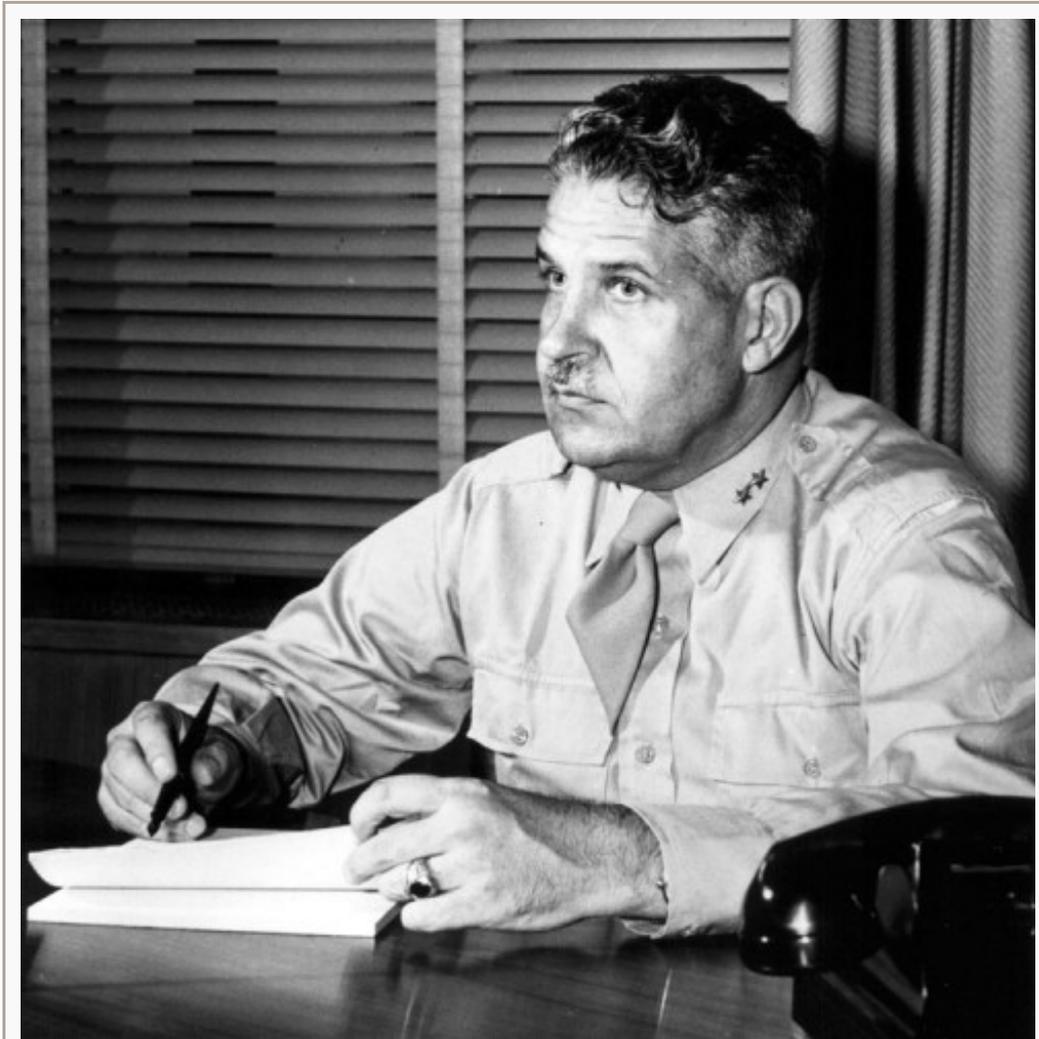
Lastly, both estimates include a desire for **10 more bombs** for "**strategic isolation of the battlefield**" — that is, keeping the Soviets from being able to move their ships or tanks or whatnot into useful places. In practice, they explain, this means **blowing up the Dardanelles, the Kiel Canal, and the Suez Canal.** That's as close as the report gets to recommending any kind of "tactical" use of the bombs. For anything smaller than that, the analysts conclude, conventional weaponry will do the trick.

So that adds up to 59 for the "minimum" and 224 for the "optimum." But they don't stop there. They assume,

based on World War II figures, that a **certain number of the bombers will get shot down, have technical problems, miss the target, or simply drop duds.** So they calculate that all of those bombs will only be 48% effective anyway, and thus they'll need just over double the total number. **So instead of about three bombs per city, they've allocated six.**

So we divide our original totals by 0.48, and we end up with the final figures of **128 as the "minimum" and 466 as the "optimum."**

Well, that's *lovely*, isn't it? **So did General Groves think about this?**



The General, Perturbed

Quoth the General: **"The number of bombs indicated as required is excessive."**²

Why? It's not because Groves thinks the entire idea is wrong, or that maybe as the world's sole nuclear power, the country could perhaps do with fewer than a hundred of these things. (*What if Groves thought the USSR was going to get a bomb soon?* you ask. Groves believed that it would take the USSR 20 years to get a bomb, so that's not the issue on his mind at this point.)

No. Groves' reasons for disagreeing are very *Grovesian*. He disagrees because *they're low-balling the destructive power of the bombs.* **"It is not essential to get total destruction of a city in order to destroy its effectiveness. Hiroshima no longer exists as a city even though the area of total destruction is considerably less than total."**

So what, we might speculate, would Groves propose as a revised version? He doesn't offer up any figures. But it's worth noting that Groves is **only** taking issue with the question of how many bombs might be needed **per city** — Groves is more or less saying that **one** should do the trick in most cases. So if we re-ran the numbers, exactly

as before, but assumed only one successful bomb per city (even leaving in the 48% fudge factor), that drops the "minimum" to around **73** and the "optimum" to **179**. That's a reducing of 40% for the minimum, and 60% for the optimum.

That's still an *ambitious* figure for September 1945, if not a somewhat bloodthirsty one. The US wouldn't hit 100+ bombs until 1948, and broke the 400 bomb mark in 1951. Of course, by *that* point, the Air Force had decided that *many more* bombs would be necessary. When we know that the peak US nuclear stockpile was **over 32,000 warheads** (in 1966), a paltry 466 looks like kid's stuff.

But from the perspective of the immediate postwar, it still seems like quite a lot. And its very ambitiousness was a sign of things to come.

Notes

1. Citation: Lauris Norstad to Leslie Groves, "Atomic Bomb Production," (15 September 1945), *Correspondence ("Top Secret") of the Manhattan Engineer District, 1942-1946*, microfilm publication M1109 (Washington, D.C.: National Archives and Records Administration, 1980), Roll 1, Target



4, Folder 3, "Stockpile, Storage, and Military Characteristics." []



2. Citation: Leslie Groves to Lauris Norstad (26 September 1945), attached to the previous document. []



Citation: Alex Wellerstein, "The First Atomic Stockpile Requirements (September 1945)," *Restricted Data: The Nuclear Secrecy Blog*, May 9, 2012, accessed November 21, 2017, <http://blog.nuclearsecrecy.com/2012/05/09/weekly-document-the-first-atomic-stockpile-requirements-september-1945/>.