

ISSUES REGARDING PRODUCTION OF NEW CHEMICAL WEAPONS

Matthew Meselson
Department of Biochemistry and Molecular Biology
Harvard University
Cambridge, MA 02138
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The Administration has requested \$163 million in fiscal 1986 for production facilities (excluding MILCON) and initial procurement of two new lethal chemical munitions. Purchase of the planned acquisition quantity is estimated to cost at least \$1.5 billion over the next five years. The two chemical weapons for which production funds are now requested are:

- 1) The M687 binary GB nerve agent 155-mm artillery projectile (\$0.5 billion);
- 2) The BLU-80/B (BIGEYE) binary VX nerve agent free-fall spraying bomb (\$1.0 billion).

An additional munition, the XM 135 binary nerve agent warhead for the MRLS multiple launch rocket system, is in advanced development. Its projected procurement cost is \$0.8 billion.

The M687 artillery projectile. In parallel letters to Senator Nunn and to Representative Addabbo, the Department of

Defense stated that:

"For procurement of new artillery shells, the need is not one of redressing a clear lack of military capability. The U.S. possesses a stockpile of chemical nerve agent artillery shells, similar to the proposed M687 binary round, that are compatible with modern 155-mm and 8-inch artillery pieces. The quantity is in the range of sufficiency (at least for U.S. forces) and actually is higher than the planned acquisition quantity for the binary projectile. The current mix of agent may not be ideal (a high percentage of persistent VX versus the nonpersistent GB in the new shell), and there are numerous operational, logistical, and safety advantages to the M687 binary projectile as opposed to the existing items. However, these factors in and of themselves, might not be sufficient to justify the expense of replacing the stockpile.

The significant questions regarding chemical artillery shells are how long will the existing shells remain usable and are they now (and will they remain) safe to fire?... The questions of the present and future usability of the artillery stockpile are critical. They also should be amenable to scientific analysis allowing informed judgments to be made on the basis of solid evidence. To address these questions, we have assembled a highly qualified panel of experts on chemistry, corrosion and explosives to assess the evidence and provide their judgments and recommendations. Again, we expect to have the results in time to allow a more informed debate of binary artillery projectile procurement."

Hearings before the Committee on
Armed Services, U.S. Senate,
February 1, 1983, page 121.

The panel of experts ("Blue Ribbon Panel") cited in the above DoD letter found that the military utility of the 155-mm and 8-inch artillery munitions had not seriously degraded. The metal shell casings were sound and the chemical agent fill was still of high purity. However, in order to obtain a reliable projection of the future stability of the chemical agent, the panel recommended certain tests, including accelerated aging tests at elevated temperatures.

A series of accelerated aging tests and other studies recommended by the Blue Ribbon Panel are nearing completion at this time. If appropriate review of the test results shows that no serious stability problem exists, there is no adequate justification for expenditures to produce new chemical artillery projectiles at this time.

Moreover, no new chemical munitions should be put into production without realistic field testing of the actual item to be produced. The currently stockpiled unitary chemical artillery munitions were certified for production only after an extensive series of test firings of actual munitions containing live agent. Numerous design faults were discovered and remedied in the course of these field tests. In contrast, the M687 binary round has been field tested only with simulants, not with live agent. The relevant chemistry is mainly an empirical science, based on trial and error. The chemistry and design features of the binary are far more complex than those of the presently stockpiled unitary munitions. The performance and reliability of the binary cannot be assured without realistic field tests. A commitment to large-scale munitions procurement without such tests is unprecedented and needlessly runs the risk that critical design faults will go undiscovered. Field tests of the M687 binary can be conducted in safety. It would be unsafe not to test it.

Once stockpiled, even munitions of proven design should be periodically test-fired to verify their continued serviceability. This applies as much to the proposed binary projectiles as to the existing unitary ones.

The BIGEYE bomb. In the case of BIGEYE, unlike the M687, there is no closely similar weapon in the present inventory. There is a substantial supply of serviceable 500-lb and 750-lb. bombs containing the non-persistent nerve agent GB. However, DoD maintains that there is an important need for a long-range delivery capability for a persistent lethal chemical such as VX. In the late 1960s the Air Force procured the TMU-28/B VX aircraft spray tank for this role. It is estimated by the British chemical warfare authority, J.P. Perry Robinson, that approximately 900 of these weapons, filled with VX, are in the current stockpile (see Table). In terms of total VX content, this is equivalent to about 10,000 BIGEYE bombs. The Air Force considers, however, that use of the TMU-28/B against heavily defended targets would risk higher attrition than delivery of BIGEYE, due to differences in delivery modes.

Like the binary artillery projectile, BIGEYE has never been field tested with real agent. Yet it is much more complex. Because of its airborne delivery, insuring complete safety of BIGEYE tests would be more complicated than doing so for artillery projectiles. Nevertheless, with precautions to preclude

high altitude release, safe testing is achievable. Realistic testing is required before the performance and reliability of BIGEYE can be confidently assured.

Beyond issues of reliability, it is questionable whether the missions envisioned for BIGEYE would be militarily effective. A mission often singled out as an example of the utility of BIGEYE is its use in conjunction with high explosive bombs for disrupting runways of enemy airbases. The rationale is to slow down the work of runway repair crews by forcing them to wear masks and protective clothing. But is the delivery of BIGEYE for this purpose an effective use of scarce U.S. air assets, when they can instead be used to destroy, divert or degrade enemy aircraft in numerous and probably more effective other ways? The trade-off in using BIGEYE to delay runway repair is highly questionable. Even if we ignore the possibility of simple runway decontamination measures, the PACT can counter the slowing effect of wearing protective equipment by assigning more manpower and repair equipment to the task of runway repair. But this kind of enemy manpower and equipment on PACT home territory is plentiful and cheap compared to the scarce, sophisticated and expensive U.S. personnel and equipment invested in trying to deliver BIGEYE to airstrips deep in highly defended hostile airspace. The Congress should insist on careful and objective studies of whether this seemingly unfavorable trade-off and other missions proposed for BIGEYE make sense.

A further problem with BIGEYE is that even if released according to plan over the intended target, 10-20% of the nerve agent is likely to drift downwind from the target area as fine mist, aerosol and vapor. Military personnel can be protected with masks and other equipment and procedures. But unless noncombatants are similarly equipped and trained, East European and Russian civilians downwind out to distances of many kilometers from heavily targeted areas will be at grave risk.

While high civilian casualty rates from BIGEYE attacks may be unavoidable, the prospect places on advocates of this weapon a heavy burden of proof to demonstrate a highly favorable cost-benefit ratio on the military side. A militarily ineffective chemical weapon that mainly threatens civilians is unreliable for deterrence and unjustifiable for war fighting.

RECOMMENDATIONS

- 1) The existing stock of 155-mm and 8-inch nerve agent munitions appears to be in good condition at present. Conduct and evaluate accelerated aging tests to determine the lifetime of the existing stocks.
- 2) Produce new chemical artillery projectiles only if the results of the above tests show that current stocks are likely to become seriously less effective over the next several years.
- 3) Require rigorous and independently evaluated testing including the field testing of weapons with live agent to establish performance and reliability before commitment to production of new types of chemical weapons.
- 4) Before any commitment to the production of BIGEYE, require thorough and objective studies evaluating the trade-offs and utility of its use for defined missions.

US CHEMICAL MUNITIONS FOR ARTILLERY AND AIRCRAFT
ESTIMATES FROM OPEN SOURCES

ITEM	TONS OF AGENT FILL	NUMBER OF ITEMS
<u>NERVE AGENT GB</u>		
105-mm howitzer rounds	750	900,000
155-mm and 8-inch howitzer rounds	850	200,000
500-lb aircraft bombs	300	3,500
750-lb aircraft bombs	1,000	9,500
<u>NERVE AGENT VX</u>		
155-mm and 8-inch howitzer rounds	950	300,000
160-gal aircraft spraytanks	630	900
<u>MUSTARD</u>		
4.2-inch mortar cartridges	1,400	500,000
105-mm howitzer rounds	700	500,000
155-mm howitzer rounds	1,600	250,000

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