

## Naval War College Review

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Volume 34  
Number 2 *March-April*

Article 16

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1981

# The ELF Odyssey: National Security Versus Environmental Protection

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### Recommended Citation

Beam, Henry H. (1981) "The ELF Odyssey: National Security Versus Environmental Protection," *Naval War College Review*: Vol. 34 : No. 2 , Article 16.

Available at: <https://digital-commons.usnwc.edu/nwc-review/vol34/iss2/16>

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models. Much more quantifiable are strategic nuclear forces. With all of its problems, measuring the strategic balance is much simpler. That is probably a major factor in the popularity of assessing the strategic balance while neglecting analysis of land forces.

The author's discussion of the technical problems associated with MBFR addresses these issues directly. He goes further in explaining some new approaches that might be taken in future negotiations and the necessary conditions for the success of each. In this respect he presents the reader with the problems and some alternative solutions as well.

In spite of these strong points, there are important deficiencies. With the author's background in mind, his book turns out to be somewhat of a disappointment. As a participant in the talks, the author might be expected to provide some insights into what went on at the negotiating table. Colonel Keliher obviously wrote under constraints imposed by convention on any official who has participated in negotiations that are still under way, but he concentrates too much on press coverage instead of recounting what happened and why. This is partly a matter of style, but it is prominent enough that the reader must continually remind himself that Soviet proposals were actually made at the negotiating table and not just released in pieces to the Eastern bloc press. On the other side of the table, there is not nearly enough on Western proposals and negotiating options. The author discusses "Option III," but not in his section on negotiations, and the reader is given no idea about what the other options were.

Another disappointment is that there is not much new in the way of analysis presented here. The final chapters on problem areas and alternative approaches are particularly clear and useful, but they merely present the thinking of Frederick Wyle, Joseph Coffey,

Steven Canby, and others. This the author is careful to acknowledge, but more is to be expected than even good summaries of what is already in print.

For those unfamiliar with MBFR, the book is slow to put the problem into geopolitical perspective. It is not until well into the fourth chapter that we are told that an offensive into Western Europe remains unattractive for the Soviets. There is more than a small chance that such an offensive could bog down, and a stalemate could precipitate the dissolution of Soviet control in Eastern Europe, if not over national minorities within the Soviet Union as well. The important threat, Keliher tells us, is from political influence over West European governments that will accrue to the Soviets when there is a gross disparity of military power in Europe. The geographical facts of proximity of the Soviet Union and remoteness of the United States are mentioned but not given the discussion they deserve. The fact that large numbers of Soviet troops are necessary to retain control over Poles, Czechs, Slovaks, East Germans, and Hungarians is mentioned only incidentally. These are fundamental parts of the MBFR problem. They should be explained and discussed at the outset. Instead, the first chapter is an essay on why Marx and Lenin thought Germany was important to socialist revolution.

This book is worthwhile for its summaries of the various negotiating positions at MBFR. It brings together some thought-provoking ideas on arms control in Europe. Its footnotes and bibliography are particularly useful. What it lacks is overall balance in presentation and discussion of the problem it addresses.

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Klessig, Lowell L., and Strite, Victor L.  
*The ELF Odyssey: National Security*

*Versus Environmental Protection.*  
Boulder, Colo.: Westview Press,  
1980. 310pp.

The development of the FBM (Fleet Ballistic Missile) submarine in the late 1950s provided the impetus for the Navy to develop a way to communicate with these submarines while on station without requiring them to come near the surface. One promising method of communicating with submerged submarines is based on ELF (extremely low frequency) radiowaves that have the capability to penetrate seawater to great depths. Prototype ELF systems operated in North Carolina (1963-1970) and at Clam Lake, Wisconsin (1970-present) have demonstrated that the concept is technically feasible. However, a full-sized system that would provide near-global coverage would require at least 10 megawatts of input power driven into a large (from 200 to 3,000 square miles) grid of insulated copper cables, grounded at each end, in order to radiate an ELF signal. Measures would need to be taken to protect telephone lines from interference and fence wires from induced currents. Communication would be one way to the submarine. Data rates at such low frequencies would be very slow and the primary use of this system would probably be to send a "bellringer" message to the submarine to position itself to receive another message at a particular time and place.

In *ELF Odyssey* Professors Klessig and Strite review the stormy history of the Navy's attempts to build a large-scale ELF system from the point of view of environmentalists concerned about the effect of prolonged low levels of ELF radiation on both people and the environment where the ELF antenna would be constructed. To their credit they declare their position at the start: "Our personal histories of opposition to ELF are acknowledged, but chiefly, we are advocates of active citizen involvement *per se*." Indeed, the book uses the "ELF Odyssey," as they call it, primarily as a

case study to demonstrate how citizen involvement, primarily at the grass roots level, can be employed to stop major projects with potentially undesirable environmental effects. It does an excellent job of this. Indeed, as a Michigan resident as well as a Naval Reserve officer, I have long followed the controversy over proposals to build an ELF antenna system in Michigan. The book accurately describes how the public outcry against *Seafarer* (as the project was then named) reached a peak in 1976 when then Presidential candidate Jimmy Carter promised Governor Milliken that *Seafarer* would not be built in Michigan against the wishes of its residents. To date it hasn't but the ELF issue probably has not been finally resolved as yet.

Readers seeking to learn the principles of ELF communication system operation won't find them in this book. Only the first of five approximately equal parts of the book is devoted to explaining the principles of ELF communication in general terms and the national security needs it would fulfill if constructed. The material given is informative, but not complete, perhaps a reflection that neither author apparently has a scientific background and that both authors, as they clearly state, have a primary interest in the environmental aspects of the ELF controversy. Valuable references omitted include the *IEEE Transactions on Communications, Volume Comm-22* of April 1974 (the entire issue is devoted to unclassified technical papers on ELF) and the *Seafarer Extremely Low Frequency (ELF) Submarine Command and Control System*, printed by the Special Communications Project Office of the Naval Electronics Systems Command. Greater depth in the technical material, perhaps in the form of an appendix, would have been useful to readers with as great an interest in national security matters as in environmental affairs.

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The remainder of the book provides valuable insights into the working of local voluntary action groups opposed to ELF in Wisconsin, Texas and Michigan, each at one time the Navy's preferred location for building the ELF antenna system. In each of these states voluntary action groups opposed to ELF came into being and successfully opposed the construction of ELF in their state. Klessig and Strite's conclusion is worth repeating to understand their intent in writing *ELF Odyssey*

Ultimately the Navy, or any other federal agency, is only responsive to Congress and the President. Ultimately the only power of citizens is political pressure applied to elected officials in the context of representative and constitutional government. That power can be shared most efficiently at the ballot box. It can be used most effectively if applied on election day, reapplied when public participation programs provide a formal opportunity and reapplied in every available informal setting.

It is important for those readers who may have supported the construction of the ELF system to note that all means of expressing opposition put forth by Klessig and Strite are entirely legal and appropriate in our system of government.

Throughout the book the authors urge citizens interested in environmental affairs to learn from the ELF experience how to organize to oppose other large projects with potentially undesirable environmental effects. Presumably these could be nonmilitary in nature as well, such as proposals to build large dams or drill for oil on public lands. But there is another side to this coin. The Navy and other agencies can also learn from *ELF Odyssey* how better to promote projects they feel are in the national interest. The authors note that, "Unlike some other agencies, the Navy was not accustomed to explaining its

operations or soliciting comments on them from citizens." I feel this is an accurate assessment of the Navy's overall approach to ELF, at least in Michigan. The Navy never really accepted the concept that local citizens should have much of a say on matters relating to national security. In the future, if the Navy and other governmental agencies can take deliberate steps to solicit and answer questions of interest to concerned local citizen groups, it will increase the likelihood of local acceptance of such projects as ELF. Indeed, the Department of Defense itself may not have to wait long to apply the lessons put forth in *ELF Odyssey*. The proposed land-based MX missile system will certainly arouse the concerted interest, if not outright opposition, of citizen and environmental action groups in whatever state is ultimately selected for its construction.

In summary, this is a useful book because it draws together in one volume a detailed history of the Navy's ELF programs, including an extensive set of references. It also shows what can be accomplished when highly motivated, well-organized local citizen action groups apply to elected officials through the legitimate means at their disposal.

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Love, Robert William, Jr., *et al.*, eds. *Changing Interpretations and New Sources of Naval History; Papers from the Third United States Naval Academy Naval History Symposium*. New York: Garland, 1980. 471pp.

The Naval History Symposium at the Naval Academy are justly famous for their fanfare. These 37 papers assembled by Professor Love and his coeditors clearly demonstrate, however, that the Third Naval History Symposium was a good deal more than outward show. For the most part avoiding strictly battle history, the