Trials and Tribulations: An Examination of the Decision to Terminate the FHE 400 Hydrofoil Project[1]

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La conception, la construction et la mise à l'essai de l'hydroptère de 200 tonnes NCSM Bras d'Or *se déroulèrent sur une période de 10 ans et coûtèrent plus de 50 millions de dollars. Cet article cherche à déterminer si les difficultés rencontrées lors du programme de mise à l'essai constituaient la vraie raison de l'abandon du navire. Après considération des politiques à l'origine du projet, de l'escalade de l'estimation des coûts à mesure que la conception progressait, des problèmes de gestion du projet associés au type de contrat attribué à l'entrepreneur principal, deHavilland, des problèmes techniques qui ont eu lieu pendant les essais en mer de l'hydroptère et de l'état précaire du financement général des programmes navals au moment de l'arrêt des travaux et de la décision d'abandonner le projet, l'article en arrive à la conclusion que de nombreux facteurs ont contribué à cette décision.*

The end of the hydrofoil project came with a whimper, not a bang. On 4 January 1977, a memorandum from the vice chief of defence staff (VCDS) to the deputy minister and the chief of defence staff (CDS) stated in part, "As a result of our evolving proposed future maritime force composition, it has now been concluded there is no longer any military requirement for *Bras d'Or* and that she is of no future use as a research vessel. ... From a military point of view *Bras d'Or* should be disposed of as soon as possible."[2]

But how did this project start and why did it come to this end? This article will examine the evidence to establish whether or not difficulties encountered in the trials program were the true reason for the decision to lay up and eventually dispose of the developmental hydrofoil, HMCS *Bras d'Or.* To do that, it will be necessary to: examine the

[1] I thought this was a unique title, but a search turned up "Trials and Tribulations of a Hydrofoil" by Cdr J.H.W. Knox in *Canadian Shipping & marine Engineering News,* April 1970,33-36. Mea culpa! A version of this paper was presented at the 7th Maritime Command Historical Conference in Ottawa, September, 2005.

[2] 11900-527 (CMDO) 4 January 1977, Department of National Defence, Directorate of History and Heritage (DHH), Hal W. Smith fonds, 2000/14 (Smith), File 004.

***The Northern Mariner/Le marin du nord,* XV, No 4, (October 2005), 43-52.**

politics and policies behind the initiation of the project; review the project's chronological history; outline cost estimate escalations as the design phase progressed; look at the effects of program delays; review project management problems associated with the form of contract awarded to deHavilland Aircraft of Canada Limited, the prime contractor; note the technology problems which arose during the hydrofoil sea trials, and finally, comment on the parlous state of funding for naval programs generally during the period of lay up and the eventual disposal decision. By way of introduction, a summary of the long Canadian involvement with hydrofoil technology may be useful.[3]

From the mid-nineteenth century there had been experimentation in several countries with the hydrofoil concept. In Canada, following the early flights of the Wright brothers and others, Alexander Graham Bell's Aerial Experiment Association looked at hydrofoil concepts as a method of lifting a seaplane free from much of the water drag that would impede takeoff. Eventually this led to the building of a series of hydrofoil craft culminating in HD-4 setting a water speed record of 62 knots in September 1919. Significantly, Bell was able to attract some international naval interest, but when push came to shove, no country was prepared to adopt the craft. During the Second World War, Bell's collaborator, Casey Baldwin, who had continued to dabble in hydrofoil initiatives over the years, developed remotely controlled targets and smoke generators that were based on hydrofoil principles. Once more there was initial naval, military and air force interest and seed funding, but again full sale commitment faded to nothing.

After the Second World War a wealthy Royal Canadian Naval Reserve officer, Lieutenant-Commander Duncan Hodgson, commissioned the New York naval architect Phil Rhodes to design a hydrofoil for an attempt at the water speed record. The Defence Research Board (DRB) got wind of this and Hodgson was convinced to change tack and instead have a vessel designed to demonstrate the naval potential of hydrofoils. This became the five-ton R-100, more commonly known as *Massawippi.* It is important to remember that this collaboration came about because of the particular interest on one person in DRB and his acquaintance with Hodgson; it was not a corporate decision shared with the Naval Service Headquarters (NSHQ). That would probably have served to improve chances of commitment and acceptance on the part of the navy. This early work was later reviewed in a report for the chief of naval staff (CNS).

> Between 1952 and 1960, experiments were conducted by NRE (Naval Research Establishment) with three small hydrofoil craft to determine the factors involved in designing hydrofoil systems for optimum sea-keeping relative to craft size.
>
> - *Massawippi...*
> - *Baddeck* (originally named *Bras d'Or),* a seventeen-ton craft

[3] For a useful historical summary, see John Boileau, *Fastest in the World: The Saga of Canada's Revolutionary Hydrofoils,* (Halifax, 2004).

designed as a scale model of a fifty-ton gunboat in which the Royal navy were interested, and

• Rx, a three-ton research craft designed by NRE as a versatile test-bed for a wide variety of foil configurations.

DRB's original objective ... was to explore the potential of the hydrofoil principle for increasing the rough water speed of surface ships, motivated by an appreciation that nuclear submarines would soon be able to outrun conventional surface ships. Early trials not only showed promise of sea-keeping ability at high speed, but indicated that a hydrofoil ship would have the seaworthiness of a conventional ship more than ten times its size, even at slow hullborne speeds.

By 1959 a broad understanding of design principles had been gained (by NRE) and (in the view of NRE) the promise appeared to be realisable in a craft sufficiently large to warrant the more direct interest of the RCN. Study teams were established at NRE to answer two questions:

- have hydrofoil craft important Canadian naval applications? If so, what are they and what characteristics would be required?

- What craft characteristics are technically feasible, and what development would be required to realize them?

The concept which evolved was to use the hydrofoil principle to produce the smallest possible ship capable of operating a destroyer-type sonar in the open ocean. The high speed dash capability of the hydrofoil would permit interception by the "grasshopper" technique, as used by helicopters.[4]

The NRE report defining the concept was sent to the CNS by the chairman of the DRB in September 1959. "This report triggered much discussion in NSHQ, with DRB exerting every effort to obtain RCN support for continued funding. The Research Working Panel of Sub-Group (A/S Warfare) of CANUKUS *[sic,* actually the Technical Coordination Program - TTCP] met at NRE in January 1960 to discuss the report; USN programs were investigated; USN support for a program was solicited by [the chairman of the DRB]. After somewhat reserved endorsement from all concerned and considerable argument between NSHQ and DRB, DRB obtained Department of Defence Production (DDP) funds for a study (essentially to verify the engineering feasibility of the NRE proposal) done by deHavilland Aircraft."[5] The two phase study, over a one year period, was funded at three hundred thousand dollars. Here is a possible early indication of less than enthusiastic RCN support for the hydrofoil project in the face of DRB lobbying. Nevertheless, the RCN did provide

[4] M.C. Eames, *Defence Science in Canada,* VII, "DRB Hydrofoil Research," Defence Research Board Report No. Plans 71-11, December 1971, DHH, Smith fonds, file 134.

[5] E.A. Jones, "A Development and Trials History of HMCS *Bras d'Or* (FHE 400)," DRAFT, Defence Research Establishment Atlantic, April 1978, (under cover of DREA/3623-9, 4 October 1978), DHH, Smith fonds, file 001.

two able and experienced representatives to the Project Review Group (PRG) set up and chaired by DDP and the manpower to assess the study's second phase report.

Much play has been given over the years to this so-called "tripartite agreement" of January 1960, largely because of the international commitment it engendered. Even the defence minister, Paul Hellyer, mentioned it as a reason to continue the program after one of the many financial crises that arose during the course of the project.[6] A comment written many years later by the US principal at the meeting best exemplifies the agreement. "It was agreed that the US and Canadian approaches would be complimentary in expanding the data base and providing the opportunity for comparison of two quite different designs."[7]

The politics behind DDP funding the study is interesting. A 1996 interview with a high-ranking DDP official of the time indicates that there was a change in thinking of the government as to the type of development and production that was both essential and feasible financially to support and maintain an aerospace industry in Canada following the Avro Arrow cancellation. Funding the deHavilland study seemed to be in line with government thinking.[8] Prudently, the RCN initiated a series of studies on the operational requirement for the vessel including the fighting needs. By late 1962, the vice chief of naval staff (VCNS) had proposed to the Naval Board that the RCN "support in principle the proposal to design and construct in Canada a prototype ocean-going hydrofoil."[9] The Naval Board itself recognized the importance of developing the hydrofoil craft further, but believed that the RCN could only assume the role of major sponsor of its development if the craft had proven anti-submarine warfare potential.[10] It therefore allocated $1.2 million for the continued development work and noted that continuation as an RCN project would depend on the results of that work and an underway weapons systems study. Rather surprisingly, three months later the board's guarded approval of continuing effort was translated into a decision to contract for ship design and construction at once. No hard evidence of the process leading to this epiphany has been found, but interviews with a number of high level naval and government people of that era indicate that there was

[6] "One more difficult decision was whether to continue development of the hydrofoil or not. The hydrofoil was our segment of a three-country project in cooperation with the United States and United Kingston. Each country agreed to test a craft of different size and design, on the understanding that its findings would be shared with the other two partners. The cost of our hydrofoil had escalated from $26.3 million to $36.2 million, and there was pressure to drop the whole project. I finally ruled otherwise because it was a Canadian commitment." Paul Hellyer, *Damn the Torpedoes,* (Toronto, 1990), 128-9. This decision was reached at the 148th meeting of the Defence Council, 17 May 1965.

[7] William M. Ellsworth, *Twenty Hydrofoil Years: The US Navy Hydrofoil* High Point *PCH-1,* (David Taylor Naval Research and Development Center, Maryland, 1986), DHH, Smith fonds, file 121.

[8] Note of interview Smith/Mundy, DHH, Smith fonds, file 148.

[9] H.W. Smith, "Hydrofoil Working Paper 3 (WP3), Hydrofoil Fighting Equipment Progress Report 2 - March 1995, note 24, DHH, Smith fonds, file 014; VCNS to Secretary, Naval Board, "Construction of a Prototype ASW Hydrofoil," 17 October 1962, Library and Archives of Canada (LAC), RG 24, 83-84/167, 3506, NSS 8000-36(Staff).

[10] WP3, note 27; Minutes 688* Meeting of Naval Board, 18 October 1962, LAC, RG 24, 83-84/167, 142, NSS 1279-65-1.

considerable pressure by DRB and DDP to get the RCN onside.[11] Here again we have the seeds of a potential negative naval attitude towards the hydrofoil.

In mid-1964 the RCN requested and received approval to continue the ship program and to proceed with the design and construction of the fighting equipment suite for the hydrofoil under separate contract with Canadian Westinghouse Company Limited. The project, as approved at that time, had the following objectives:

> - to establish the feasibility of open-ocean operation of small surface-piercing hydrofoils, and to test the validity of the design predictions used in determining the characteristics ofthe developmental prototype ship; and
> - to develop a frighting equipment system that would be attuned to the characteristics of the ship design and would permit a thorough assessment of the ship's capabilities in ASW operations.

It was planned that the entire proj ect would be completed by mid-1968.[12] In November 1966, while the ship was under construction at Marine Industries Limited, Sorel, Quebec, a major fire occurred during tests of the auxiliary gas turbine engine installation. Extensive structural damage was done, principally in the engine room, and repair necessitated the removal of the installed engine room equipment and systems for overhaul and inspection.

In July 1968, still without its foilborne transmission but otherwise ready to launch, the ship was transferred to Halifax on the slave dock which served as its maintenance base. It was launched there for alongside systems activation. On 18 July 1968, the hydrofoil was commissioned as HMCS *Bras d'Or,* pennant number FHE 400. In September a brief spell of hullborne sea trials was undertaken as a continuation of systems activation, and later in the month the ship was docked to fit the foilborne transmission. In March 1969 the ship was finally re-launched for foilborne trials. A variety of engineering problems arose, but all were eventually overcome. They involved the displacement transmission, the bow-foil pivot bearing, the tip and steering actuators, the electrical system and the hydraulic pumps. The a large crack was discovered in the lower surface of the main high-speed foil. With the removal of the neoprene layer, with which the foils were coated, an extensive network of cracks was found entering the spar and rib members of the structure. This disastrous development, thought to be due to leakage of seawater into the foil interior (past a supposedly sealed plug), led to stress corrosion at the welds with significant residual stresses. A new centre-foil was fitted in October 1970 and foilborne trials resumed. When the system was inspected after a Halifax-Bermuda-Norfolk round trip, it was discovered that this foil too had developed major cracks and that extensive cracking was also present in other foil systems. The unmistakable inference from this was that a major redesign and rebuild of the foil system would be necessary before trials could continue.

From September 1968 until July 1971 when trials terminated, the ship logged 648

" WP3, note 28.

[12] Cdr P.D.C. Barnhouse, "The Canadian Hydrofoil Project," *Canadian Forces Maritime Engineering Journal,* Winter, 1985,5.

hours of sea time, of which 96 were foilborne. The highest speed attained was 63 knots in three- to four-foot waves, whilst 42 knots was achieved in twelve-foot seas. The ship also made a 2,500-mile round trip from Halifax to Bermuda. The hullborne range at 12 knots proved to be approximately 2,500 miles and, foilborne at 45 knots ranges varied from 900 miles in calm water to 600 miles in 12-foot seas. Hullborne sea keeping and manoeuverability were excellent with rough weather pitch and have motions comparable to those of a 3,00-ton St Laurent class destroyer. Foilborne motions in high sea states were similar to aircraft motions in turbulence, making it difficult for crew to move about. Although seated personnel had no difficulty. In the end though, the combination of delays and cost increases resulted in the main weapon system never bing fitted for performance evaluation.[13]

Starting in the summer of 1971 and continuing into the fall, at Canadian Forces Headquarters serious consideration was given to the future of the hydrofoil as a component of Canada's navy. A Defence Research Analysis Establishment report of the previous year[14] had concluded that estimates of relative ASW performance between various hydrofoil configurations and other ships and aircraft was sensitive to assumptions of hydrofoil sonar capability, a capability that had not been established because of the decision not to fit the ship's weapons system. It had also concluded that "cost considerations are inconclusive" without additional engineering studies. Plainly, more time and money would have to be expended to answer the uncertainties. In July, CDS informed Defence Council that "the high cost of acquisition, the uncertainty about its fighting performance, and extreme budget limitations, cause us to put it last on the priority list for surface ships."[15] Notwithstanding this low priority, in September CDS stated at Defence Council that "although the hydrofoil would not be able by itself to fulfill all of the surface ship functions in the primary role of surveillance and control in protection of Canada, it could perform many tasks of this role quite well. Given the objective of a general purpose force, procurement could not be recommended solely on the strength of this potential, and it is essential that the vessel be shown to have a collective defence capability before it is considered for employment." To obtain this information, CDS recommended full operational evaluation at a cost of almost $6 million.[16] However, in discussion at Defence Council on 6 October 1971, CDS emphasized the low position on the priority list and his concern that there would not be sufficient resources to go into production. In support, VCDS brought attention to the $30 million required to bring the hydrofoil to production status and sated that in his opinion "judgement would have top be made against the established priorities and it was his view

[13] *Ibid.,* 6-8.

[14] D.M. Murray, "A Review and Appreciation of ASW Hydrofoils," Defence Research Analysis Establishment Memorandum No. M18, February 1970, DHH, Smith fonds, file 011.

[15] DHH, Smith fonds, file 124, V1.900-FHE 400, 20 July 1971.

[16] DHH. Smith fonds, file 015, VI 1,900-FHE 400 (DC Plans), 27 September 1971.

that there simply wasn't sufficient money available."[17] The minister deferred a decision at the meeting, but on 2 November he announced in the House of Commons the decision to lay up the ship for a period of five years.

Thus, in November 1971, with the agreement of Treasury Board, FHE 400 was placed in a state of reservation for a period of five years. The CDS suggested the rationale for this in a letter to retired Rear Admiral Welland. He wrote that the decision "leaves us with options which outright cancellation of the project would have denied us."[18] A measure of uncertainty of the times is obvious from a submission to the VCDS: "Any decision made at this time concerning the future of hydrofoils in the Canadian Armed Forces, for ASW or other roles, must of necessity, be based on insufficient evidence. For example, until such time as the basic ASW equipment is fitted and the concept actually evaluated against the performance of existing ASW vehicles, the effectiveness of this concept will not be fully known. [Also]... Canada's changing defence policies dictate an examination of other roles for hydrofoils."[19] In October 1976 the preservation period was extended a further five years in view of the then current stage of the ship replacement program (which eventually evolved into the Canadian patrol frigate) in which was seen a possible long-term option for non-conventionally hulled ships. Given the ongoing development in non-conventional; hulls, and the relatively small amount of preservation funds required, it was considered prudent to retain FHE 400 as a possible useful platform for future trials and development at the least expense.

Almost immediately, as a result of the evolving proposed future maritime force composition, it was concluded that the military requirement for FHE 400 no longer existed. In addition it was estimated that more than $6 million would be required to activate the ship as a research vessel even if the requirement did exist. Consequently, as quoted above, the VCDS recommended that the vessel be disposed of as soon as possible. The navy's thinking is reflected in a letter of March 1978 from the chief of maritime doctrine and operations to a private citizen. "As a result of experience with the hydrofoil *Bras d'Or,* we have determined that such vessels are not suitable for all our naval defence roles at home and within our alliances. We have also recognized that Canada cannot afford the expense of having both a fleet of hydrofoils for one set of missions and a separate fleet of larger conventional ships for a different set of missions - especially when our many studies revealed that the latter can satisfactorily perform all our missions, whereas the former cannot."[20] The disposal agreed to, FHE 400 was first offered "as is" to other government departments and industry. There was no interest, so it was determined that the ship should be offered to a museum after removal of all equipment useful to DND. Finally, with the aid of the Museum of Science and Technology, the Bernier Maritime Museum obtained HMCS

[17] DHH, R.L. Raymont fonds, 73/1223 Box 48 (Raymont), file 896, V1,900-FHE 400 (DG Plans), 9 September 1971.

[18] *Ibid.,* file 897, SI 1,900-FHE 400 (CDS), 3 November 1971.

[19] DHH, Smith fonds, file 143, VI 1,500-502 (DERMS), November 1970 (Draft).

[20] DHH, Smith fonds, file 004.

Bras d'or in 1983.[21]

The frequent cost escalations was a predominant feature of the hydrofoil project which may have coloured perceptions in subsequent project disposition discussions.[22] An underestimation of the project complexity, component failures during design, build and trials, and project delays all contributed. In December 1962 the Treasury Board approved inclusion of $13 million ($10 million for ship design and construction; $2 million for fighting equipment, and $1 million for support facilities) in the 1963164 estimates on the basis on a Naval Board recommendation to proceed with design and construction. In April 1963 , Treasury Board approved a funding limit of $9.1 million for ship construction. Then, in 1964 Treasury Board approved an increase ofthe ship construction funding imitto $16.3 million, to include spare parts procurement, trials and post-acceptance support. This was followed in August 1964 with approval of the fighting equipment contract funding limit of $4.355 million, thus pushing the total to over $20 million. In January 1965 the board approved a further increase to $21.775 million in the 1965/66 RCN development estimates on the basis of steady increases in actual and expected costs as the design and development work advanced. This was the first estimate to follow the completed detailed design study report. Treasury Board increased the funding limits again in July 1965 to $28.759 million for the ship and $7.441 million for fighting equipment. The ship increase was continuation of a trend. The fighting equipment estimate was the first to be based on the contractor's design report. In April 1966 limits were increased again to $35.992 million for the ship and $7.93 million for fighting equipment, a total of $43.922 million. The ship increase was partly the result of more realistic estimating based on a better appreciation of the program component and more effective control by the project office and the recently formed DND/DDP project management group. It also reflected increasingly evident program delays.

One year later, Treasury Board approved a further increase in funding to $39.847 million for the ship and $10.132 million for fighting equipment, now making the total just over $50 million. At the same time, it warned that it would not permit any more increases. The latest round in increases were the result of three major setbacks; failure on test of bow foil and anhedral tip hydraulic actuators; failure on test of the foilborne transmission system, and the engine room fire. The direct cost of reworking and redesigning the failed and damaged material was compounded in all segments of the project by the twenty-month overall delay in the expected launch date. In June 1967 the foilborne transmission suffered a test failure further settings its delivery back an estimated twelve months. In addition, it became evident that the ship contractor would be unable by some months to meet the projected launch date on which the funding level had been based. Both would contribute to an increase in costs. As Treasury Board would not entertain any increased funding, it became necessary to reduce the program scope. This was achieved in October 1967 by deciding to defer fitting the fighting equipment and postponing cutting the variable depth

[21] Barnhouse, 9.

[22] "FHE 400 ASW Hydrofoil Project: Background paper prepared for the Management Review Group - Support Services Sub-Group," November 1970, DHH, Smith fonds, file 134.

sonar well in the stern. Following the foil failure discovered during the summer of 1969, Treasury Board approved $450,000 for a replacement centre foil and directed that operation and maintenance funds, previously accounted for separately, should be included in the project funds. The effect was to approve a new ceiling of $52.2 million. The final cost escalation occurred in October 1971 when the project ceiling was raised by one million dollars to cover the cost of preserving the ship and fighting equipment, and completing the documentation.

These cost escalations and project slippages can be ascribed in part to a number of contract-related factors including:

> - failure of the multiple incentive-type ship contract to act as a satisfactory spur to the (ship) contractor (deHavilland), while at the same time inhibiting DND personnel in their attempts to enforce quality assurance and a detailed design review in advance of assembly or construction;
> - weak management practices by the ship contractor such as inadequate in-house production planning, tardy and inaccurate supply of engineering information, lack of a strong program manager and neglect of accepted management tools and methods;
> - the complications resulting from too liberal an application of aircraft practices to the unforgiving marine environment; and
> - shortage of willing and able sub-contractors for one-off state-of-the-art work, and the difficulty of competing with the Vietnam War demands and priorities of US contractors.[23]

However, these problems were not all.

The official record shows that the decision to terminate the hydrofoil project was based on the navy's analysis of the capability of hydrofoil-type ships in performing roles assigned in accordance with the governments policies of the day. This analysis placed hydrofoils fourth and last on the priority list of surface ships. Uncertainty as to the vessel's fighting performance, a direct result of the deferral of fitting fighting equipment, played a major part in this analysis, but the projected high acquisition costs and stringent budget limitations of the day tilted the balance.

Did the history of the hydrofoil project have a subliminal influence on the decision? Of the RCN had initiated the development project, if there had been little or no cost escalation, if there had been no delays in the project, if there had been minimal technical and managerial problems during design and build, if there had not been the catastrophic foil failures during trials, and if the fighting equipment suite could have bene evaluated for operational performance, then perhaps the assigned priority might have been different. One may safely conclude that difficulties encountered during trials were not the one determining

Ibid.

factor in terminating the project.

CORRECTION

Our review of Colin White, *Nelson: The New Letters* by Alec Douglas which appeared in the last issue of the concluded with the statement, "The problem is, it omits the footnotes, which are as follows..." Dr Douglas has pointed out that indeed the book is very well documented. We apologize for that error; the corrected review is included in this issue, on page 99.

Z-Drive - Drive system employed on a hydrofoil to transmit power from theengine in the hull to propellers through horizontal shafts leading to a bevelgear, then via vertical shafts and second bevel gear to the horizontal propellershaft, thus forming a "Z" shape. See Chapter 7.Â iscreated by means of the flow itself, as from the free surface in the case of asurface- piercing, ventilated strut. "Forced ventilation" exists when the air iscontinuously supplied into the cavity by auxiliary means such as a pump.Waterjet - A water propulsion system consisting of an inlet, a duct, and anexit nozzle, or combination thereof, with a pump located in the duct fortransferring energy from a prime mover to the fluid. HMCS Bras d'Or (FHE 400) was a hydrofoil that served in the Canadian Forces from 1968 to 1971. During sea trials in 1969, the vessel exceeded 63 knots (117 km/h; 72 mph), making her the fastest unarmed warship in the world. The vessel was originally built from 1960 to 1967 for the Royal Canadian Navy, as a project for the testing of anti-submarine warfare technology on an ocean-going hydrofoil.Â In 1909 the lake was also the historic site of the first flight of an aircraft in Canada and the British Commonwealth; the airplane, named the Silver Dart, was built by the Aerial Experiment Association under Dr. Bell's tutelage. The lake's name was thus fitting for a hydrofoil vessel which could 'fly' above an ocean's surface. Trials terminate for a variety of reasons, not all of which reflect failures in the process or an inability to achieve the intended goals. Primary outcome data were reported most often when termination was based on data from the trial.Â The views expressed in this article are those of the authors and do not necessarily reflect the positions of the NIH. NLM had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation of the manuscript and decision to submit the manuscript for publication. NLM reviewed and approved the manuscript prior to publication. Competing interests: RJW is assistant director, TT is program analyst, and DAZ is director of ClinicalTrials.gov.