As filed with the Securities and Exchange Commission on August 2, 2004 Registration No. 333-_____

UNITED STATES SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, D.C. 20549

FORM S-8 REGISTRATION STATEMENT UNDER THE SECURITIES ACT OF 1933

USEC INC.

(Exact Name of Registrant as Specified in its Charter)

Delaware (State of Incorporation) 52-2107911 (I.R.S. Employer Identification No.)

2 Democracy Center 6903 Rockledge Drive Bethesda, MD 20817 (Address of Principal Executive Offices)(Zip Code)

USEC Inc. 1999 Equity Incentive Plan (Full Title of the Plan)

Ellen C. Wolf Senior Vice President and Chief Financial Officer USEC Inc. 2 Democracy Center 6903 Rockledge Drive Bethesda, MD 20817 (301) 564-3200

(Name, Address and Telephone Number of Agent for Service)

CALCULATION OF REGISTRATION FEE

Title of Securities	Amount	Proposed Maximum	Proposed Maximum	Amount of
To Be	To Be	Offering Price Per	Aggregate Offering	Registration
Registered	Registered (1)	Share (2)	Price	Fee
Common stock, par value \$.10 per share	5,100,000 shares	\$8.14	\$41,514,000	\$5,259.82

(1) If, as a result of stock splits, stock dividends or similar transactions, the number of securities purported to be registered by this registration statement changes, the provisions of Rule 416 under the Securities Act of 1933 shall apply to this registration statement, and this registration statement shall be deemed to cover the additional securities resulting from the split of, or the dividend on, the securities covered by this registration statement

(2) Pursuant to Rule 457(h) of the Securities Act of 1933, and solely for the purpose of calculating the registration fee, the proposed maximum offering price per share is based on the average of the high and low sales prices of USEC's common stock on the New York Stock Exchange on July 28, 2004.

PART I

INFORMATION REQUIRED IN THE SECTION 10(a) PROSPECTUS

Item 1. Plan Information.*

Item 2. Registrant Information and Employee Plan Annual Information.*

* The information specified by Item 1 and Item 2 of Part I of Form S-8 is omitted from this filing in accordance with the provisions of Rule 428 under the Securities Act of 1933, as amended (the "Securities Act") and the introductory note to Part I of Form S-8. The documents containing the information specified in Part I will be delivered to the participants in the plan covered by this registration statement as required by Rule 428(b).

PART II

INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

Item 3. Incorporation of Documents by Reference.

The Securities and Exchange Commission (the "SEC") allows us to "incorporate by reference" the information we file with them, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is an important part of this registration statement, and information that we file later with the SEC will automatically update and supersede this information. We incorporate by reference the documents listed below and any future filings made with the SEC under Sections 13(a), 13(c), 14, or 15(d) of the Securities and Exchange Act of 1934, as amended (the "Exchange Act"), until such time as this registration statement is no longer in effect.

- (a) Our Annual Report on Form 10-K for the year ended December 31, 2003;
- (b) Our Quarterly Report on Form 10-Q for the quarter ended March 31, 2004;
- (c) Our Current Reports on Form 8-K filed on April 22, 2004, June 4, 2004, July 14, 2004 and July 30, 2004;
- (d) All other reports filed by USEC Inc. pursuant to Section 13(a) or 15(d) of the Exchange Act since December 31, 2003; and
- (e) The description of our common stock, par value \$.10 per share, contained in our Registration Statement No. 333-57955 on Form S-1 filed with the SEC on June 29, 1998 and incorporated by reference in our Registration Statement on Form 8-A dated July 8, 1998 (File No. 001-14287).

You may access a copy of any filings referred to above (excluding exhibits), at no cost, on USEC's website at <u>www.usec.com</u>, or by contacting us at the following address:

Investor Relations USEC Inc. 2 Democracy Center 6903 Rockledge Drive Bethesda, Maryland 20817 Telephone: (301) 564-3200 Risk relating to the lack of an updated consent of Arthur Andersen LLP:

The consolidated balance sheets of USEC Inc. as of June 30, 2001 and the related consolidated statement of income, stockholders' equity and cash flows for such period, which are included in the Report on Form 10-K, which is incorporated by reference herein, was audited by Arthur Andersen LLP. Arthur Andersen LLP has stopped conducting business before the SEC, has ceased accounting and audit-related practice and has limited assets available to satisfy the claims of creditors. Due to the status of Arthur Andersen LLP, we have not been able to obtain, after reasonable efforts, the written consent of Arthur Andersen LLP to the inclusion of their report in the Report on Form 10-K, which is incorporated by reference herein, and we have dispensed with the requirement to file their consent in reliance on Rule 437a promulgated under the Securities Act. Because Arthur Andersen LLP has not consented to the inclusion of its report in the Report on Form 10-K, which is incorporated by reference herein, investors' ability to assert claims against Arthur Andersen LLP may be limited. In particular, because of this lack of consent, investors will not be able to sue Arthur Andersen under Section 11(a)(4) of the Securities Act for any untrue statements of a material fact contained in, or an omission to state a material fact required to be stated in, the financial statements audited by Arthur Andersen LLP that are included in the Report on Form 10-K, which is incorporated by reference herein.

Item 4. Description of Securities.

Not applicable.

Item 5. Interests of Named Experts and Counsel.

Not applicable.

Item 6. Indemnification of Directors and Officers.

Section 145 of the General Corporation Law of the State of Delaware (the "DGCL") empowers a Delaware corporation to indemnify any person who was or is a party to or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of the corporation) by reason of the fact that such person is or was a director, officer, employee or agent of such corporation, or is or was serving at the request of such corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise. The indemnity may include expenses (including attorney's fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by such person in connection with such action, suit or proceeding, provided that such person acted in good faith and in a manner such person reasonably believed to be in or not opposed to the best interests of the corporation and, with respect to any criminal action or proceeding, had no reasonable cause to believe such person's conduct was unlawful.

A Delaware corporation may indemnify directors, officers, employees and other agents of such corporation in an action by or in the right of the corporation under the same conditions, except that no indemnification shall be made if such person is adjudged to be liable to the corporation. Where a director, officer, employee or agent of the corporation is successful on the merits or otherwise in the defense of any action, suit or proceeding referred to in this Item 6 or in defense of any claim, issue or matter herein, the corporation must indemnify such person against the expenses (including attorney's fees) which he or she actually and reasonably incurred in connection therewith.

Both our Bylaws and Certificate of Incorporation require us to indemnify each of our directors and officers to the fullest extent permitted by law, subject to certain exceptions, in connection with any actual or threatened action or proceeding arising out of his or her service to us or to other organizations at our request.

As permitted by Section 102(b)(7) of the DGCL, our Certificate of Incorporation also contains a provision eliminating the personal liability of a director to USEC Inc. or our shareholders for monetary damages for breach of fiduciary duty as a director, subject to certain exceptions.

In addition to indemnification provided for in our Certificate of Incorporation and Bylaws, we have entered into indemnification agreements with our directors and executive officers. We intend to enter into indemnification agreements with any new directors and executive officers in the future.

Item 7. Exemption from Registration Claimed.

Not applicable.

Item 8. Exhibits.

The following is a list of exhibits filed as part of this registration statement.

<u>Exhibit No.</u>	Description
4.1	Certificate of Incorporation of USEC Inc. (1)
4.2	Amended and Restated Bylaws of USEC Inc., dated September 13, 2000. (2)
4.3	Rights Agreement, dated April 24, 2001, between USEC Inc. and Fleet National Bank, as Rights Agent, including the form of Certificate of Designation, Preferences and Rights as Exhibit A, the form of Rights Certificates as Exhibit B and the Summary of Rights as Exhibit C. (3)
5.1	Opinion of Skadden, Arps, Slate, Meagher & Flom LLP.
23.1	Consent of Independent Registered Public Accounting Firm.
23.2	Consent of Skadden, Arps, Slate, Meagher & Flom LLP. (included in the Opinion filed as Exhibit 5.1)
24.1	Power of Attorney. (included on the signature page)
99.1	USEC Inc. 1999 Equity Incentive Plan. (4)
99.2	First Amendment to the USEC Inc. 1999 Equity Incentive Plan. (5)

(1) Incorporated by reference to Registration Statement on Form S-1, No. 333-57955, filed June 29, 1998.

(2) Incorporated by reference to Quarterly Report on Form 10-Q for the quarter ended September 30, 2000.

(3) Incorporated by reference to Registration Statement on Form 8-A filed April 24, 2001.

(4) Incorporated by reference to Registration Statement on Form S-8, No. 333-71635, filed February 2, 1999.

(5) Incorporated by reference to Annex B of Schedule 14A filed on March 31, 2004, with respect to the 2004 Annual Meeting of Shareholders.

Item 9. Undertakings.

The undersigned registrant hereby undertakes:

(a) (1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) to include any prospectus required by Section 10(a)(3) of the Securities Act of 1933;

(ii) to reflect in the prospectus any facts or events arising after the effective date of this registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in this registration statement; and

(iii) to include any material information with respect to the plan of distribution not previously disclosed in this registration statement or any material change to such information in this registration statement;

provided, however, that paragraphs (i) and (ii) above do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in periodic reports filed by the registrant with or furnished to the Commission pursuant to Section 13 or Section 15(d) of the Exchange Act that are incorporated by reference in this Registration Statement.

(2) That, for the purposes of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(b) That, for purposes of determining any liability under the Securities Act of 1933, each filing of the registrant's annual report pursuant to Section 13(a) or Section 15(d) of the Exchange Act (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Exchange Act) that is incorporated by reference in this registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(c) Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Act and will be governed by the final adjudication of such issue.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-8 and has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Bethesda, State of Maryland, on this 2nd day of August, 2004.

USEC INC.

By: /s/ William H. Timbers William H. Timbers President and Chief Executive Officer

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below, acting in the capacity or capacities stated opposite their respective names, hereby constitutes and appoints William H. Timbers, Ellen C. Wolf and Timothy B. Hansen, and each of them, our true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, to do any and all acts and things and execute, in the name of the undersigned, any and all instruments which said attorneys-in-fact and agents may deem necessary or advisable in order to enable USEC Inc. to comply with the Securities Act of 1933, as amended (the "Securities Act"), and any requirements of the Securities and Exchange Commission in respect thereof, in connection with the filing with the Securities and Exchange Commission of this Registration Statement on Form S-8 under the Securities Act, including specifically but without limitation, power and authority to sign the name of the undersigned to such Registration Statement, and any amendments to such Registration Statement (including post-effective amendments), and to file the same with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, to sign any and all applications, registration statements, notices or other documents necessary or advisable to comply with applicable state securities laws, and to file the same, to there documents in connection therewith with the appropriate state securities authorities, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and to perform each and every act and thing requisite or necessary to be done in and about the premises, as fully and to all intents and purposes as the undersigned might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, and any of them, or their substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this Registration Statement has been signed by the following persons in the capacities indicated on this 2nd day of August, 2004.

SIGNATURE	TITLE
/s/ James R. Mellor James R. Mellor	Chairman of the Board and Director
/s/ Michael H. Armacost Michael H. Armacost	Director
/s/ Joyce F. Brown Joyce F. Brown	Director
/s/ John R. Hall John R. Hall	Director
/s/ W. Henson Moore W. Henson Moore	Director
/s/ Joseph F. Paquette, Jr. Joseph F. Paquette, Jr.	Director
/s/ William H. Timbers William H. Timbers	President, Chief Executive Officer and Director (Principal Executive Officer)
/s/ James D. Woods James D. Woods	Director
/s/ Ellen C. Wolf Ellen C. Wolf	Senior Vice President and Chief Financial Officer (Principal Financial and Accounting Officer)

Exhibit Index

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Incorporated by reference to Registration Statement on Form S-1, No. 333-57955, filed June 29, 1998. (1)

Incorporated by reference to Registration Statement on Form 51, No. 335 57755, filed rule 29, 1990. Incorporated by reference to Registration Statement on Form 8-A filed April 24, 2001. Incorporated by reference to Registration Statement on Form S-8, No. 333-71635, filed February 2, 1999. (2)

(3)

(4)

Incorporated by reference to Annex B of Schedule 14A filed on March 31, 2004, with respect to the 2004 Annual Meeting of Shareholders. (5)

[LETTERHEAD OF SKADDEN, ARPS, SLATE, MEAGHER & FLOM LLP]

August 2, 2004

USEC Inc. Two Democracy Center 6903 Rockledge Drive Bethesda, MD 20817

RE: USEC Inc. Registration Statement on Form S-8

Dear Ladies and Gentlemen:

We have acted as special counsel to USEC Inc., a Delaware corporation (the "Company"), in connection with the registration of 5,100,000 shares (the "Shares") of the Company's common stock, par value \$.10 per share (the "Common Stock"), issuable pursuant to the USEC Inc. 1999 Equity Incentive Plan, as amended (the "Plan").

This opinion is being furnished in accordance with the requirements of Item 601(b)(5) of Regulation S-K under the Securities Act of 1933, as amended (the "Act").

In connection with this opinion, we have examined originals or copies, certified or otherwise identified to our satisfaction, of (i) the Registration Statement on Form S-8 as filed with the Securities and Exchange Commission (the "Commission") on the date hereof (the "Registration Statement"); (ii) a specimen certificate representing the Common Stock; (iii) the Certificate of Incorporation of the Company, as currently in effect; (iv) the Amended and Restated By-Laws of the Company, as amended to date and currently in effect; (v) the Plan; (vi) certain resolutions of the Board of Directors of the Company relating to the issuance and sale of the Shares and related matters; and (vii) certain resolutions of the stockholders of the Company relating to the Plan. We also have examined originals or copies, certified or otherwise identified to our satisfaction, of such records of the Company and such agreements, certificates of public officials, certificates of officers or other representatives of the Company and others, and such other USEC Inc. August 2, 2004 Page 2

documents, certificates and records as we have deemed necessary or appropriate as a basis for the opinions set forth herein.

In our examination, we have assumed the legal capacity of all natural persons, the genuineness of all signatures, the authenticity of all documents submitted to us as originals, the conformity to original documents of all documents submitted to us as certified, conformed or photostatic copies and the authenticity of the originals of such latter documents. In making our examination of documents executed or to be executed by parties other than the Company, we have assumed that such parties had or will have the power, corporate or other, to enter into and perform all obligations thereunder, and we have also assumed the due authorization by all requisite action, corporate or other, and execution and delivery by such parties of such documents and the validity and binding effect thereof on such parties. As to any facts material to the opinions expressed herein which we have not independently established or verified, we have relied upon statements and representations of officers and other representatives of the Company and others.

We have also assumed that each award agreement setting forth the terms of each grant of options or other awards under the Plan will be consistent with the Plan and will be duly authorized and validly executed and delivered by the parties thereto.

We do not express any opinion as to the laws of any jurisdiction other than the corporate laws of the State of Delaware, and we do not express any opinion as to the effect of any other laws on the opinion stated herein.

Based upon and subject to the foregoing, we are of the opinion that when (i) the Registration Statement becomes effective under the Act, (ii) certificates representing the Shares to be issued under the Plan in the form of the specimen certificate examined by us have been manually signed by an authorized officer of the transfer agent and registrar for the Common Stock and registered by such transfer agent and registrar, and (iii) such certificates have been delivered and paid for in accordance with the terms and conditions of the Plan at a price per share not less than the per share par value of the Common Stock, the issuance and sale of such Shares will have been duly authorized, and subject to any restrictions imposed by the Plan, such Shares will be validly issued, fully paid and nonassessable.

We hereby consent to the filing of this opinion with the Commission as an exhibit to the Registration Statement. In giving this consent, we do not thereby admit that we are included in the category of persons whose consent is required under Section 7 of the Act or the rules and regulations of the Commission.

Very truly yours,

/s/ SKADDEN, ARPS, SLATE, MEAGHER & FLOM LLP

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in this Registration Statement on Form S-8 of USEC Inc. of our report dated February 11, 2004 relating to the consolidated financial statements of USEC Inc., which appears in USEC Inc.'s Annual Report on Form 10-K for the year ended December 31, 2003.

/s/ PricewaterhouseCoopers LLP

McLean, Virginia July 30, 2004