

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. 2009 Equity Incentive Plan
(Full Title of the Plan)

John C. Barpoulis
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)

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer or a smaller reporting company. See the definitions of "large accelerated filer", "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer	<input checked="" type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input type="checkbox"/>	Smaller reporting company	<input type="checkbox"/>

CALCULATION OF REGISTRATION FEE

Title of Securities To Be Registered	Amount To Be Registered (1)(2)	Proposed Maximum Offering Price Per Share (3)	Proposed Maximum Aggregate Offering Price (3)	Amount of Registration Fee (3)
Common Stock, par value \$.10 per share	8,479,867 shares	\$4.57	\$38,752,992	\$4,499.22

(1) We are registering 8,479,867 shares of our common stock pursuant to the USEC Inc. 2009 Equity Incentive Plan. Pursuant to Rule 416(a) under the Securities Act of 1933, this registration statement shall be deemed to cover an indeterminate number of additional shares that may become issuable as a result of stock splits, stock dividends or similar transactions pursuant to the anti-dilution provisions of the USEC Inc. 2009 Equity Incentive Plan.

(2) Includes preferred stock purchase rights (the "Rights") which, prior to the occurrence of certain events, will not be exercisable or evidenced separately from our common stock. Value attributable to such Rights, if any, is reflected in the market price of our common stock. The terms of the Rights are described in the Rights Agreement filed as Exhibit 1 to our registration statement on Form 8-A filed with the Securities and Exchange Commission on April 24, 2001 and the First Amendment to the Rights Agreement filed as Exhibit 4.1 to the current report on Form 8-K filed with the Securities and Exchange Commission on May 25, 2010.

(3) 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 our common stock on the New York Stock Exchange on April 26, 2011.

EXPLANATORY NOTE

This registration statement on Form S-8 is filed by USEC Inc. to register an additional 8,479,867 shares of its common stock which may be issued under the USEC Inc. 2009 Equity Incentive Plan, as amended (the "Plan"). On April 28, 2011, USEC's shareholders approved an amendment to the Plan (the "Amendment"), effective February 17, 2011, which increased the number of shares of common stock which may be issued under the Plan by 3,000,000. As a result, the total number of shares of common stock available for issuance under the Plan are: (i) 7,500,000 shares plus (ii) the number of shares, if any, underlying grants under the USEC Inc. 1999 Equity Incentive Plan that are forfeited, canceled, terminated or settled in cash without the delivery of shares on or after April 30, 2009. In addition to the 3,000,000 shares covered by the Amendment, USEC is also registering on this Form S-8 an additional 5,479,867 shares underlying grants under the USEC Inc. 1999 Equity Incentive Plan that were outstanding as of April 30, 2009. This amount represents the maximum number of additional shares that may be added to the Plan pursuant to clause (ii) above should such grants be forfeited, canceled, terminated or settled in cash without the delivery of shares.

PART I

INFORMATION REQUIRED IN THE SECTION 10(A) PROSPECTUS

The documents containing the information specified in Item 1 and Item 2 of Part I of the registration statement on Form S-8 are omitted from this filing in accordance with the provisions of Rule 424 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 sent or given to employees as specified by Rule 428(b)(1) of the Securities Act. These documents and the documents incorporated by reference in this registration statement pursuant to Item 3 of Part II of this registration statement, taken together, constitute a prospectus that meets the requirements of Section 10(a) of the Securities Act.

PART II

INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

Item 3. Incorporation of Documents by Reference.

The following documents filed by us with the Securities and Exchange Commission pursuant to the Securities Exchange Act of 1934, as amended (the "Exchange Act") are incorporated by reference in this registration statement:

(a) Our Annual Report on Form 10-K for the year ended December 31, 2010, filed with the Securities and Exchange Commission, or SEC, on February 24, 2011, and the portions of our Proxy Statement, filed with the SEC on March 17, 2011, for our 2011 Annual Meeting of Shareholders incorporated by reference into our Annual Report;

(b) Our Current Reports on Form 8-K filed with the SEC on January 10, 2011, February 16, 2011, February 18, 2011, February 23, 2011 (Item 5.02 only) and March 24, 2011; and

(c) A description of our common stock and preferred stock purchase rights included under "Item 1. Description of Registrant's Securities to be Registered" in the Amendment No. 1 to the Registration Statement on Form 8-A (File No. 001-14287), as filed with the Securities and Exchange Commission on April 30, 2008, including any amendment or report filed for the purpose of updating such description.

In addition to the foregoing, all documents subsequently filed by us with the Securities and Exchange Commission pursuant to Sections 13(a), 13(c), 14 and 15(d) of the Exchange Act, prior to the filing of a post-effective amendment which indicates that all securities offered under this registration statement have been sold or which deregisters all securities remaining unsold, shall be deemed to be incorporated by reference into this registration statement and to be a part of this registration statement from the date of filing of such documents, except for information that is deemed "furnished" and not "filed" for purposes of the Exchange Act. Any statement contained in a document incorporated by reference in this registration statement shall be deemed to be modified or superseded for purposes of this registration statement to the extent that a statement contained herein or in any subsequently filed document that is also incorporated by reference herein modifies or supersedes such statement. Any statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this registration statement.

Item 4. Description of Securities.

Not applicable.

Item 5. Interest 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 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 unless, and only to the extent that, a court determines that such person fairly and reasonably is entitled to indemnity for expenses the court deems proper in light of liability adjudication. 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. In addition, we maintain directors' and officers' liability insurance.

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>	<u>Description</u>
4.1	Certificate of Incorporation of USEC Inc., as amended (incorporated by reference to Exhibit 3.1 to the Quarterly Report on Form 10-Q for the quarter ended September 30, 2010).
4.2	Amended and Restated Bylaws of USEC Inc., dated May 25, 2010 (incorporated by reference to Exhibit 3.1 of the Current Report on Form 8-K filed on May 25, 2010).
4.3	Rights Agreement, dated April 24, 2001, between USEC Inc. and Mellon Investor Services LLC (f/k/a 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 (incorporated by reference to Exhibit 1 to Registration Statement on Form 8-A filed on April 24, 2001).
4.4	First Amendment dated May 25, 2010, to Rights Agreement, dated April 24, 2001, between USEC Inc. and Mellon Investor Services LLC, as Rights Agent (incorporated by reference to Exhibit 4.1 of the Current Report on Form 8-K filed on May 25, 2010).
5.1	Opinion of SNR Denton US LLP.
23.1	Consent of PricewaterhouseCoopers LLP, independent registered public accounting firm.
23.2	Consent of SNR Denton US LLP (included in the Opinion filed as Exhibit 5.1).
24.1	Power of Attorney (included on the signature page of this registration statement).
99.1	USEC Inc. 2009 Equity Incentive Plan (incorporated by reference to Exhibit 10.1 of the Current Report on Form 8-K filed on May 6, 2009).
99.2	First Amendment to USEC Inc. 2009 Equity Incentive Plan (incorporated by reference to Annex A of the Definitive Proxy Statement on Schedule 14A filed on March 17, 2011).

Item 9. Undertakings.

(a) The undersigned registrant hereby undertakes:

(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. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in aggregate, the changes in volume and price represent no more than a 20 percent change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective 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 (a)(1)(i) and (a)(1)(ii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Securities and Exchange Commission by the registrant pursuant to section 13 or section 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in this registration statement.

(2) That, for the purpose 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.

(4) That, for the purpose of determining liability of the registrant under the Securities Act of 1933 to any purchaser in the initial distribution of the securities:

That in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

(i) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;

(ii) Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;

(iii) The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and

(iv) Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

(b) The undersigned registrant hereby undertakes 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 Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the 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 29th day of April, 2011.

USEC INC.

By: /s/ John K. Welch
John K. Welch
President and Chief Executive Officer

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints John K. Welch, John C. Barpoulis and Peter B. Saba, and each of them, the undersigned's true and lawful attorneys-in-fact and agents, with full power of substitution and revocation, for and in the undersigned's name, place and stead, in any and all capacities, to sign any and all amendments (including post-effective amendments) to this registration statement on Form S-8 and to file the same, with all exhibits thereto, and other documents in connection therewith, with the SEC, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done, as fully to all intents and purposes as the undersigned might or could do in person, hereby ratify and confirming all that said attorneys-in-fact and agents or any of them, or their or his substitutes, may lawfully do or cause to be done by virtue thereof.

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 29th day of April, 2011.

SIGNATURE

TITLE

/s/ John K. Welch
John K. Welch

President, Chief Executive Officer and Director
(Principal Executive Officer)

/s/ John C. Barpoulis
John C. Barpoulis

Senior Vice President and Chief Financial Officer
(Principal Financial Officer)

/s/ J. Tracy Mey
J. Tracy Mey

Vice President and Chief Accounting Officer
(Principal Accounting Officer)

/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/ Sigmund L. Cornelius
Sigmund L. Cornelius

Director

/s/ Joseph T. Doyle
Joseph T. Doyle

Director

/s/ H. William Habermeyer
H. William Habermeyer

Director

/s/ William J. Madia
William J. Madia

Director

/s/ W. Henson Moore
W. Henson Moore

Director

/s/ Hiroshi Sakamoto
Hiroshi Sakamoto

Director

/s/ Walter E. Skowronski
Walter E. Skowronski

Director

/s/ M. Richard Smith
M. Richard Smith

Director

/s/ Michael S. Taff
Michael S. Taff

Director

Exhibit Index

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April 29, 2011

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

Re: Registration Statement on Form S-8

Ladies and Gentlemen:

We have acted as special counsel to USEC Inc., a Delaware corporation (the "Company"), in connection with the proposed issuance of 8,479,867 shares (the "Shares") of common stock, par value \$0.10 per share (the "Common Stock"), pursuant to the Company's 2009 Equity Incentive Plan (the "Plan"). The 8,479,867 Shares are composed of (i) 3,000,000 shares of Common Stock, which reflect an increase in the number of shares issuable under the Plan, as approved by USEC's shareholders on April 28, 2011, and (ii) 5,479,867 shares of Common Stock, which reflect the number of shares underlying grants issued under the USEC Inc. 1999 Equity Incentive Plan, which grants may be forfeited, canceled, terminated or settled in cash without the delivery of shares (collectively, "Canceled") on or after April 30, 2009 and if any of such shares are Canceled, such shares will increase in the number of shares issuable under the Plan. The Shares include preferred stock purchase rights (the "Rights"), which are issuable pursuant to a rights agreement, dated as of April 24, 2001, between the Company and Mellon Investor Services LLC (f/k/a Fleet National Bank), as rights agent, and the first amendment thereto, dated as of May 25, 2010 (as amended, the "Rights Agreement"). The Shares and the Rights are included in a registration statement on Form S-8 under the Securities Act of 1933, as amended (the "Act"), being filed with the Securities and Exchange Commission (the "Commission") contemporaneously herewith (the "Registration Statement"). This opinion is being furnished in connection with the requirements of Item 601(b)(5) of Regulation S-K under the Act.

As such counsel, we have examined such matters of fact and questions of law as we have considered appropriate for purposes of this letter. With your consent, we have relied upon certificates and other assurances of officers of the Company and others as to factual matters without having independently verified such factual matters.

This opinion is limited to the laws of the United States of America and Delaware corporate law (which includes the Delaware General Corporation Law and applicable provisions of the Delaware constitution, as well as reported judicial decisions interpreting same) and does not purport to express any opinion on the laws of any other jurisdiction.

Subject to the foregoing and the other matters set forth herein, it is our opinion that, as of the date hereof, when the Shares shall have been duly registered on the books of the transfer agent and registrar therefor in the name or on behalf of the purchasers, and have been issued by the Company against payment therefor (not less than par value) in the circumstances contemplated by the Plan and the Rights Agreement, (i) the issue and sale of the Shares, inclusive of the Rights, will have been duly authorized by all necessary corporate action of the Company and the Shares, inclusive of the Rights, will be validly issued and (ii) the Shares will be fully paid and nonassessable. In rendering the foregoing opinion, we have assumed that the Company will comply with all applicable notice requirements regarding uncertificated shares provided in the General Corporation Law of the State of Delaware.

This letter assumes, with your consent, that the Board of Directors of the Company has acted in accordance with its fiduciary duties in adopting the Rights Agreement, and does not address whether the Board of Directors may be required to redeem or terminate, or take other action with respect to, the Rights in the future based on the facts and circumstances then existing. Moreover, this letter addresses corporate procedures in connection with the issuance of the Rights, and not any particular provision of the Rights or the Rights Agreement. It should be understood that it is not settled whether the invalidity of any particular provision of a rights agreement or of rights issued thereunder would result in invalidating in their entirety such rights.

This opinion is for your benefit in connection with the Registration Statement and may be relied upon by you and by persons entitled to rely upon it pursuant to the applicable provisions of the Act. We consent to your filing this opinion as an exhibit to the Registration Statement. In giving such consent, we do not thereby admit that we are in the category of persons whose consent is required under Section 7 of the Act or the rules and regulations of the Commission thereunder.

Very truly yours,

/s/ SNR Denton US 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 our report dated February 24, 2011 relating to the financial statements and the effectiveness of internal control over financial reporting, which appears in USEC Inc.'s Annual Report on Form 10-K for the year ended December 31, 2010.

PricewaterhouseCoopers LLP
McLean, Virginia
April 29, 2011