

News Release Flow-Through:  
News Release/News Article LSA Metric

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Abstract

This paper describes the exploration of latent semantic analysis (LSA) as possible automated, statistically reliable metric for measuring the degree to which a particular news release influences a particular news article or story.

In the exploratory study, LSA provides a useful evaluative metric to indicate whether the news release impacted a news article. Additionally, the LSA metric is useful for relative scoring - potentially indicting strong, medium or weak coherence between news releases and news stories.

## **News Release Flow-Through:**

### **News Release/News Article LSA Metric**

#### **Introduction**

As a part of media relations, getting the message from a news release to a reader or viewer via a news source is a strategic task for public relations practitioners. (Newsom & Haynes, 2005) The objective, quite simply, is to affect media - to get our skillfully crafted message into a news article or story in a comprehensible way for the reader or viewer. Wilcox (2001) points out that news releases often form the basis of stories - creating awareness about ideas, situations, services and products. While some news releases are not serious - only lightweight efforts to attract attention to the company or organizations name on a slow news day - generally news releases are serious public relations activities. (Schenkler & Herrling, 2004)

We work hard in our media relations to build relationships with the media. We work hard to construct the perfect news release to tell our story. We not only want our story carried, but we also want our story told as closely as possible to our news release. We recognize, of course, that the final determination of what is used, when it is used, and in what form it is used, is the gatekeeper's decisions - not ours. (Newsom & Haynes, 2005) In a Louisiana study, Turk (1985) found that only about half of the information provided to journalists by state

government public information officers was used in published stories. Our stories are often incomplete - usually with us happy to have any mention.

While public relations practitioners cannot simply get anything they want in print or on the air, strategic decisions about message, medium and public require accountability through strategic evaluation. A sampling of generally used methods for media analysis and some of the companies involved include: 1) clipping / monitoring ([www.burrellesluce.com](http://www.burrellesluce.com), [www.metromonitor.com](http://www.metromonitor.com) ); 2) content analysis ([www.ogilvypr.com](http://www.ogilvypr.com), [www.impacon.com](http://www.impacon.com); and 3) a variety of dashboard metrics. ([www.measuresofsuccess.com](http://www.measuresofsuccess.com), [www.echoresearch.com](http://www.echoresearch.com) ). We need to improve our evaluation techniques constantly. We need to be developing useful and efficient methods to add to our public relation's evaluation and research toolbox.

What if we had a statistically reliable metric for measuring the degree to which a particular news release impacted a particular news article or story? This paper describes the exploration of a statistical technique called latent semantic analysis (LSA) to measure semantic relatedness of news releases in corresponding journalistic articles.

### **Previous Research**

Most of the academic research on news releases focuses on identifying formative and situational characteristics of news release success or failure. Reasons for news release inclusion or rejection include source location and orientation toward consumer

information and coming events (Morton, 1986). Turk (1985, 1986) identified newsworthiness and timing as critical. In other studies, reasons for news release rejection include poor execution (Williams, 1994), poor syntactical structure (Walters and Walters, 1992), length and clarity (Marken, 1994), content relevance to community (Griffin and Dunwoody, 1995), lack of local angle (Minnis and Pratt, 1995) and public agenda mismatch (Walters, Walters and Gray, 1996). Bollinger (2001) defined news release success as generating many articles from one release, and determined likelihood through content analysis based on dynamic social impact theory: strength, immediacy, and message number. She found higher impact for generating multiple articles from an active activity, celebrity involvement, upcoming events, quotations and occurrence in the local area.

During the past few decades, cognitive scientists and computational psycholinguistics developed LSA as a statistical model for comparing semantic similarity of units of text to each other. The LSA statistic computations represent the contextual-usage meaning of words in a text (Landauer & Dumais, 1997). A more complete description of LSA is found in Landauer, Foltz & Laham (1998) and the seminal article of Deerwester, Dumais, Furnas, Landauer and Harshman, (1990).

LSA provides an automatic method for comparing units of textual information to each other in order to determine their semantic relatedness. Deerwester, Dumais, Furnas, Landauer and Harshman (1990) originally designed LSA to improve information

retrieval methods by performing retrieval based on derived "semantic" content of words in a query (e.g. "Googling") as opposed to performing direct word matching.

"We would like a representation in which a set of terms, which by itself is incomplete and unreliable evidence of the relevance of a given document, is replaced by some other set of entities which are more reliable indicants. We take advantage of the implicit higher-order (or latent) structure in the association of terms and documents to reveal such relationships." (Deerwester et al. 1990)

The development of LSA was at Bellcore (now Telcordia) in the late 1980s. The United State Patent 4,839,853 was granted on June 13, 1989 to inventors Scott C. Deerwester, Susan T. Dumais, George W. Furnas, Richard A. Harshman, Thomas K. Landauer, Karen E. Lochbaum, Lynn A. Streeter. A cross-language information retrieval patent followed (US Patent 5,301,109, April 5, 1994).

The specific application of LSA for informational retrieval is now called latent semantic indexing (LSI). What is the difference between LSA and LSI? Simply, LSI refers to using the approach for indexing or information retrieval; LSA refers to all other applications. The Telcordia LSI reference site provides excellent background materials. (<http://lsi.argreenhouse.com>) Additionally, a very comprehensible discussion of the information retrieval process using the technique is from the National Institute of Technology in Liberal Education, [javelina.cet.middlebury.edu/lisa/out/lisa\\_intro.htm](http://javelina.cet.middlebury.edu/lisa/out/lisa_intro.htm)

The theoretical assumption of LSA is there is some underlying or "latent" structure in the pattern of word usage across documents. Meanings of a word modify as we use a word in

different contexts. Similarly, different words sometimes have the same meaning depending on contexts. The idea of latent semantic analysis is that the aggregate of all the word contexts in which a particular word does, and does not, appear provides a set of mutual constraints that reflects the similarity of meaning of words to each other. (Foltz, 1996)

Since LSA is automatic, without human coders, there are no constraints on the size of the text analyzed. This permits efficient and economical analysis of the semantic structure of large bodies of text.

In short, this measure is based on a powerful statistical analysis of direct and indirect relations among words and passages in a large text corpus and can capture the extent to which two text units are discussing semantically related information.

### **Research Questions**

Can LSA be adapted to help some aspects of public relations evaluation? The beginning exploration asks:

1. Can LSA provide a metric to indicate relatedness of a news release to a news article?

Exploration 1: Can LSA metrics identify different news articles impacted by the same news release?

Exploration 2: Can LSA metrics identify when a news release does not impact a news article?

2. Is there discriminating LSA scoring for news releases/  
news articles with varying relatedness?

Exploration 3: Do LSA metrics provide a range of metrics to discriminate semantic impact of a news release on a news article?

Exploration 4: Can the LSA cosine ranges be evaluative -- indicating strong, medium, weak or minimal impact of a news release on a news article?

### **Method**

In this study, we use latent semantic analysis to determine the coherence of news releases and news articles. Varieties of news release/news article situations were used in the exploratory study. The method is described in Foltz (1996) and more completely summarized in readings at <http://lsa.colorado.edu/>.

As previously mentioned, LSA is an automatic statistical technique for inferring relations for expected contextual usage of words in passages of text. This application of LSA takes as its input only raw text parsed into words, defined as unique character strings and separated into groupings (news releases and news articles.) It uses no humanly constructed dictionaries, semantic networks, grammars, syntactic parsers, etc. Inference of semantic relatedness is from contextual usage.

The first step is to select the news release and relevant news article for comparison.

Using LSA software, the second step is to generate a matrix of occurrences of each word in each document. Text is represented

as a matrix with each row standing for a unique word and each column stands for a text passage. Each cell contains the frequency with which the word of its row appears in the passage denoted by its column.

Next, the cell entries undergo a preliminary transformation with each cell frequency weighted by a function that expresses both the word's importance in the particular passage and the degree to which the word type carries information in the discourse domain in general.

LSA applies singular value decomposition (SVD) to the matrix. This is similar to factor analysis. In SVD, the rectangular matrix is decomposed into the product of three other matrices. One component matrix describes the original row entities as vectors of derived orthogonal factor values, another describes the original column entities in the same way, and the third is a diagonal matrix containing scaling values. SVD decomposes the word-by-document matrix into a set of  $k$  orthogonal factors (generally 100 to 300) from which the original matrix can be approximated by a least-squares best fit.

The result of the SVD analysis is a  $k$ -dimensional vector space containing a vector for each term and each document. The vector location reflects the correlations in their use across documents. The location of document vectors reflects correlations in the terms used in the documents. In this space the cosine between vectors corresponds to estimate semantic similarity. The theoretical cosine range can be from +1.00 to -1.00, although in

practicality, even two completely different English language texts will, at most, fall into the teens. Our concern is generally at the other end of the spectrum. A higher cosine (closer to 1.00) means higher shared meanings. For a visual representation of the cosine and vector relationship, see <http://www.ies.co.jp/math/java/trig/cosbox/cosbox.html>.

In short, determining the cosine of vectors of two pieces of textual information allows us to determine the semantic similarity between them.

### **Findings**

We select news releases and news articles on the same topic from Lexis-Nexis to conduct several LSA explorations into news release/news article relatedness.

Research question 1 asks: Can LSA provide a metric to indicate level of relatedness of a news release to a news article?

First, we explore whether LSA metrics are similar for similar stories based on the same news release. In exploration 1, an Office Depot news release (12/22/2003) is compared with two articles about Office Depot. (Palm Beach Post 12/23/2003; Waste News 1/5/2004). The cosine for release/Waste News article is .76; cosine for release/Palm Beach Post article is also .76. (See Appendix 1 for text of release and articles) The cosine represents the angles of the vectors and corresponds to estimate of semantic similarity. A higher cosine (closer to 1.00) means

higher shared meanings. In this exploration, LSA identifies relatedness of a release with similar semantic texts (news articles).

Second, we explore whether LSA metrics can show when a news release does not contribute/relate to a news story. In Exploration 2, we compare a Cargill news release with the two articles about Office Depot. The cosine for the Cargill release/Waste News article is .45; cosine for Cargill release/Palm Beach Post article is .44. (See Appendix 2 for text of Cargill release).

Since this is a known to be an "unrelated" news release to the two news articles, the mid-.40s level is at or below the relatedness threshold. If we look at the LSA literature, we find that .60 cosine has been previously used as a minimum level indicating relatedness (Blackmon, Kitajima & Polson 2003).

Our second research question is: Is there discriminating LSA scoring for news releases/news articles with varying relatedness?

For Exploration 3, seven sets of 3M news releases and news stories from the corporate web site and Lexis-Nexis are matched. The following were the news release dates and cosines for the related news articles.

7/21/03 cosine = .77  
7/22/03 cosine = .81  
7/22/03 cosine = .85  
8/12/03 cosine = .78  
8/22/03 cosine = .67  
8/25/03 cosine = .69  
9/26/03 cosine = .67

The range is from a low of .67 to a high of .85 for the related news releases/ news articles.

An additional five sets of 3M news releases were matched with articles about other topics. This is a variation of Exploration 2 with the Cargill news release and Office Depot stories. Even though the news releases are not on the same topic, they were all 3M news releases so the expectation is the cosines will be higher than the totally non-related sets.

The following were the news release dates and cosines for the non-related news articles.

7/24/03	cosine = .55
8/05/03	cosine = .44
9/13/03	cosine = .53
9/18/03	cosine = .51
10/08/03	cosine = .50

The range is from a low of .44 to a high of .55 for the non-related, related company release/article sets.

As we look at the range of LSA metrics for news releases/news articles, some news releases are strongly related (coherent) to the article, others have more moderate coherence and some are weakly related. In Exploration 4, three examples from Bangor Hydro-Electric Company news releases and news articles in the local press, wire services, or trade magazines point to the potential usefulness of LSA metrics in evaluation. Cosines range from a strong impact (.86), to medium impact (.72), to weak coherence (.63). Each are briefly described below and included in the appropriate Appendix.

On May 21, 2003, a news release from Brascan Power and Bangor Hydro-Electric announced a joint project to build a new transmission line system. The May 22, 2003 article in the Bangor Daily News was strongly impacted by the release (LSA cosine = .86). Appendix 3 shows the text of the release and article.

On March 27, 2002, Bangor Hydro-Electric announced restructuring, including early retirement and severance packages. The news story in *Electrical Week* on April 1, 2002 has an LSA cosine = .72, reflecting inclusion of information from other sources and medium semantic coherence from the news release. Appendix 4 shows the release and article.

On June 6, 2002, Bangor Hydro-Electric announced the Maine Public Utilities Commission's alternative transmission rate plan. An AP story, also on June 6<sup>th</sup>, has an LSA cosine = .63, indicating weak semantic coherence. Appendix 5 includes the release and article.

### **Discussion and Conclusions**

This exploratory project utilizes news releases in a variety of configurations. It raises a number of possibilities about the possible use of automated LSA scoring to provide metrics of the impact of news releases on news articles.

The first research question is positively answered in the explorations.

Exploration 1 provides an initial indication that the LSA metrics can score release/story relatedness on underlying semantic structure rather than word matching. The LSA metrics are

identical (cosine = .76) showing semantic coherence, but the articles are written differently. The expectation would be for both news articles to show up together in a database search. This is why LSA, originally developed to improve indexing, provides such good contextual search capabilities. More importantly, however, it initially demonstrates that although two articles are written very differently, LSA can provide a reliable metric measurement of relatedness of the source news release to the target news article.

Exploration 2 helps in probing the lower end LSA scoring of semantic relatedness with a test of the two Office Depot news articles with a Cargill news release. The test is of known unrelated news release. With cosines of .45 and .44 the levels are below anticipated minimum levels of .60. The .60 cosine is a minimum level indicating relatedness established by Blackmon, Kitajima & Polson (2003) relating to web pages and hyperlinks. Future test can determine if the .60 level is an appropriate standard. Minimally this exploratory test points to the ability of LSA to detect non-relatedness of news releases to news articles.

The second research question is also positively answered. LSA can provide a useful relative score, showing the degree of semantic relatedness of a news release and a news article.

Exploration 3 involves 3M news releases and news articles. From the 3M topic-related news releases/news articles selected, the range (.67 - .85) demonstrates a level of discrimination of

the scale. Again, while more research needs to be done to establish the appropriate scale levels, this exploratory study has semantically related measures in the .60's, .70's and .80's, tentatively defined as weak, medium and strong relatedness or coherence respectively.

The five sets of articles matched with 3M news releases about other topics add additional insight into the minimum cosine level of relatedness/coherence. The range (.44 - .55) corresponds to previous LSA research. It is also higher than the earlier exploration of totally unrelated news release/news articles (.44 and .45).

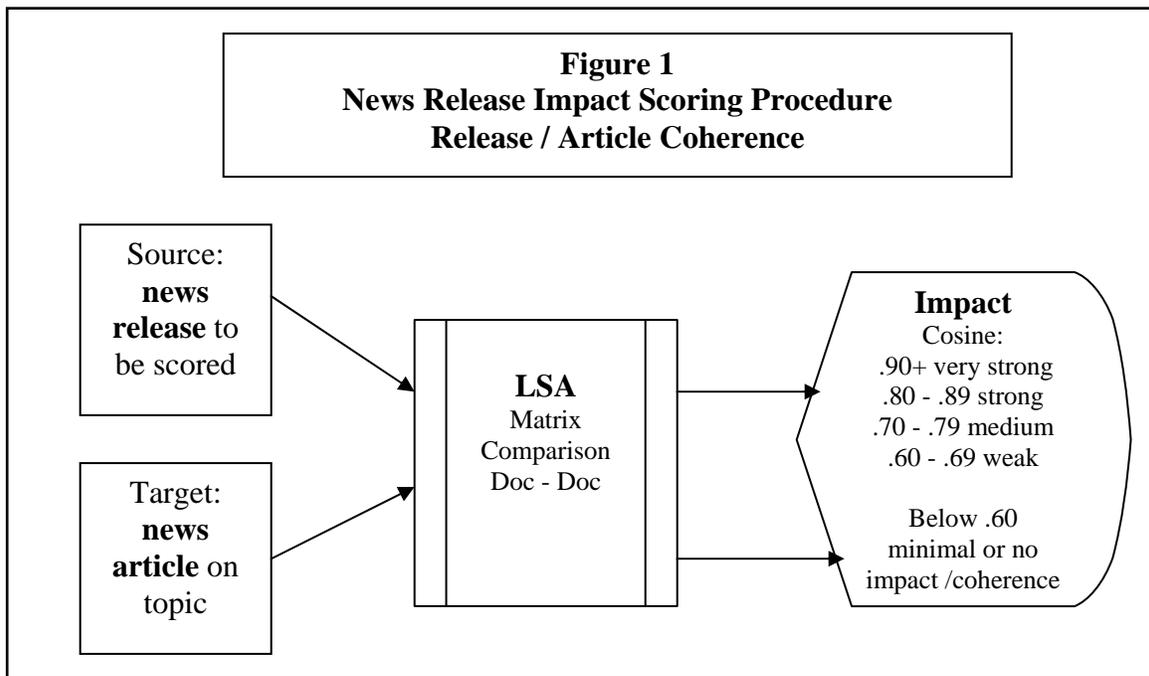
Examples from Exploration 4 demonstrate a range of LSA cosines from strong impact (.86), to medium impact (.72) and to weak coherence (.63). It is clear from the exploratory study that LSA has the ability to differentiate levels of coherence, although, because of the limitations of an exploratory study, additional research will be needed to verify and clarify LSA usage, especially the gradation of cosine levels.

To summarize (Figure 1) a possible automated LSA process for scoring news releases impact on news articles, step one is to determine the source news release and the target news article to be scored.

Step two is to perform LSA matrix comparison, document-to-document.

Step three is to interpret the scale of the document-to-document comparison for news release flow-through. As an

exploratory level for future study, if the cosine is less than 0.60, there is minimal/no relatedness (release/article coherence). The message from the release is probably not flowing through the article to the reader. The scale of release/ article coherence range is from the .60s to the .80s in the related set explorations.



The integration of LSA can add to our evaluation toolbox and become a new strategic tool. Future research will expand the applications of latent semantic analysis in public relations evaluation.

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<http://www.burrellesluce.com/> Burrelle's / Luce

<http://www.echoresearch.com/> Echo Group

<http://www.ies.co.jp/math/java/trig/cosbox/cosbox.html>

<http://www.impacon.com/> IMPACON, Ltd.

[http://javelina.cet.middlebury.edu/lsa/out/lsa\\_intro.htm](http://javelina.cet.middlebury.edu/lsa/out/lsa_intro.htm)

National Institute of Technology in Liberal Education

<http://www.lsa.colorado.edu/> SALSA Lab, University of Colorado at Boulder

<http://lsi.argreenhouse.com/lsi/LSI.html> Telcordia

<http://www.measuresofsuccess.com/> KDPaine & Partners

<http://www.metromonitor.com/> Metro Monitor

<http://www.ogilvypr.com/> Ogilvy Public Relations

**Appendix 1: Office Depot News Release 12/22/03 and News Articles from Palm Beach Post 12/23/03 and Waste News 1/5/04 (Test 1; cosines = .76; .76)**

**Office Depot Announces "'Green Book'" Catalog**

Sets Milestone as First Catalog Exclusive to Environmentally Preferable Products Printed on Elemental Chlorine Free 100% PCW Recycled Paper DELRAY BEACH, Fla.--(BUSINESS WIRE)--Dec. 22, 2003-- Office Depot, Inc. (NYSE:ODP), one of the world's largest resellers of office products, is coloring the New Year green with the launch of The Green Book, the industry's first catalog consisting solely of environmentally preferable products that is printed on elemental chlorine free, 100 percent post-consumer waste (PCW) recycled content paper.

The catalog will be available to Office Depot's Business Services Division contract customers in time for the New Year and will contain more than 1,000 products ranging from paper and filing to storage, dated goods and machine supplies.

"We are pleased to be the first in our industry to provide an easy-to-use, streamlined and environmentally responsible vehicle for our customers to purchase products containing recycled content," said Tyler Elm, Director of Environmental Affairs for Office Depot. "This is another great advance in Office Depot's commitment to helping our customers improve their company's environmental sustainability and helping them make their own office an 'office for the environment'." Elm noted that "as the industry leader in environmental stewardship, it is important for Office Depot to communicate the scope of our environmentally friendly product offerings to our customers in a manner that substantially conserves natural resources."

According to Elm, compared to catalogs printed on virgin paper, the 100 percent post-consumer recycled content paper used for The Green Book:

- is 44% more energy efficient;
- resulted in 37% fewer greenhouse gas emissions;
- generated half as much solid waste and water effluent; and
- required no new trees to be cut down.

Further, because The Green Book is printed on paper made entirely from PCW recycled fiber manufactured without using elemental chlorine, Office Depot conserved the following resources:

- 275 fully grown trees
- 116,900 gallons of water
- 193 million BTU's of energy
- 12,400 pounds of solid waste
- 24,000 pounds of CO2 greenhouse gasses, and
- 800 pounds of Chemical Oxygen Demand (COD) waterborne waste.

To put this into perspective, Elm noted that:

The 275 trees conserved by printing on recycled paper absorb the carbon released by 475 cars in a year - driven 15,000 miles each. The water conserved by printing on recycled paper is equal to the amount consumed each day by 1,800 people.

The energy saved by printing on recycled paper is equivalent to 1,544 gallons of gasoline - or the amount of energy used each day by 2,000 people.

The waste reduced by using recycled paper is equivalent to the trash discarded each day by nearly 3,000 people.

The green-house gasses not emitted into the air because of the use of recycled paper are equivalent to permanently taking an SUV off the road.

"The creation of The Green Book is Office Depot's latest reinforcement of the company's recycling and pollution reduction initiatives, and is an excellent example of the steps we are taking to promote and develop markets for environmentally sound products," Elm concluded.

About Office Depot

With annual sales of nearly \$13 billion, no one sells more office supplies to more customers in more countries than Office Depot. Founded in 1986 and headquartered in Delray Beach, FL, the company conducts business in 22 countries and employs nearly 50,000 people worldwide.

Office Depot is an industry leader in every distribution channel - from retail stores and contract delivery to catalogs and e-commerce. The company is the world's number two online retailer - on target to generate \$2.5B in sales for FY'03. In North America, Office Depot has more than 870 retail stores in addition to a national business-to-business delivery network supported by 24 delivery centers, more than 60 local sales offices and 13 regional call centers. The company's common stock is traded on the New York Stock Exchange under the symbol ODP and is included in the S&P 500 Index. Additional press information can be found at: <http://mediarelations.officedepot.com>. CONTACT: Office Depot, Delray Beach , Brian Levine, 561-438-2895, [blevine@officedepot.com](mailto:blevine@officedepot.com) SOURCE: Office Depot, Inc. "Safe Harbor" Statement under the Private Securities Litigation Reform Act of 1995: Statements in this press release regarding Office Depot, Inc.'s business which are not historical facts are "forward-looking statements" that involve risks and uncertainties. For a discussion of such risks and uncertainties, which could cause actual results to differ from those contained in the forward-looking statements, see "Risk Factors" in the Company's Annual Report or Form 10-K for the most recently ended fiscal year.

#### **Office Depot launches Green Book**

*By Palm Beach Post Staff Reports*

Tuesday, December 23, 2003

Office Depot Inc. (NYSE: ODP, \$16.32) is making another appeal to the environmentally conscious with the launch of The Green Book, a new catalog for its business customers.

The catalog, which goes out next week, offers 1,300 environmentally friendly products and was printed on recycled paper.

Printing the catalog on recycled paper saved 275 trees, 16,900 gallons of water and 12,400 pounds of solid waste, said Tyler Elm, the company's director of environmental affairs.

Elm said the Delray Beach-based office supply giant has a built-in customer base for the environmentally friendly products in government agencies, universities and school districts that are mandated to buy recycled products.

#### **Office Depot offers 1st green catalog**

*By Waste News*

January 5, 2004

Delray Beach, Fla. - Office Depot Inc., a retailer of office products, is introducing the industry's first catalog consisting entirely of environmentally preferable products printed on chlorine-free, 100 percent post-consumer recycled-content paper.

The catalog, called The Green Book, will contain more than 1,000 products and will be available to business customers by Jan. 1,

according to the company.

Office Depot operates more than 870 retail stores in addition to a national business delivery network.

**Appendix 2: Cargill News Release for the Two Office Depot News Articles (Test 2; cosines = .44; .45)**

**Cargill To Temporarily Shut-down Guntersville, Ala. Soybean Processing Plant**

Dec. 19, 2003 Contacts: David Feider, (952) 742-6910

GUNTERSVILLE, Ala. — Effective Monday, Jan. 5, 2004, Cargill will temporarily shut down processing activity at its Guntersville, Ala. soybean crushing facility.

Company officials point to the rapid disappearance rate of this year's drought-reduced soybean crop and the expected market ramifications entering next spring and summer as key factors in idling its Alabama crush operations.

"It makes no sense for us to produce exportable surpluses in the short term, only to exacerbate the problem of dwindling domestic supplies we'll face next spring, so we are taking appropriate action now," said R. Wayne Teddy, president of Cargill's North American Grain & Oilseed Crushing business. "We anticipate that supply constraints will impact our soybean crush activities throughout the coming spring and summer," he said. "Current conditions of poor margins and carrying charges support these actions."

Teddy indicated that Guntersville customers would be served by other Cargill crush plants with no interruption in service.

The Guntersville plant has 39 employees, who will not be laid off but continue to report to work.

Cargill, Incorporated is an international marketer, processor and distributor of agricultural, food, financial and industrial products and services with 98,000 employees in 61 countries. The company provides distinctive customer solutions in supply chain management, food applications, and health and nutrition.

**Appendix 3: May 21, 2003 Bangor Hydro-Electric Company Release (cosine = .86 with May 22, Bangor Daily News story which follows)**

**Brascan Power and Bangor Hydro Open New Transmission Line in Maine**

Contact for Brascan Power : Jeff Martin (207) 723-4341 ext. 100 Contact for Bangor Hydro-Electric Company: Rob Bennett (207) 973-2841

MILLINOCKET, Maine, May 21, 2003 Brascan Power Corporation and Bangor Hydro-Electric Company today announced that a joint project to build a new transmission line system, interconnected with the New England power grid, is now complete and operational. The new line stretches 25 miles and includes two new substations, with a 126-megawatt (MW) capacity. The total project cost was US\$17 million.

This is an important project for the Katahdin area. The expanded transmission capability has fueled the economy in the area and provided several jobs during the life of the project. It also provides a more flexible and reliable source of energy for the region's industrial base and will enable us to attract new businesses commented Ray Robinson, Chief Operating Officer of Bangor Hydro.

The construction of this transmission line follows the acquisition by Brascan Power in January 2002, of six hydroelectric generating

facilities in Maine from Great Northern Paper Company including a 20 MW interconnection to Bangor Hydro. The expansion of the existing transmission line to 126 MW was completed by Brascan and Bangor Hydro within 15 months from the planning stage, which is half the time normally required for a project of this size and scope.

Brascans business strategy is to own and operate high quality assets in key North American markets. This project with Bangor Hydro enhances the companys generating facilities in Maine and strengthens the reliability of the regional power supply by accommodating 126 MW of power flow to and from the New England power grid concluded Richard Legault, President and Chief Operating Officer of Brascan Power.

Brascan Corporation is a North American based real estate, power generation and asset management company. With US\$15 billion of invested capital, current operations include 55 premier properties and 39 power generating facilities. Brascan is listed on the Toronto Stock Exchange under the symbol BNN.A and the New York Stock Exchange under the symbol BNN.

Bangor Hydro-Electric Company is a regulated electric transmission and distribution utility wholly-owned by Emera Inc. BHE serves a population of 192,000 in an area encompassing 5,275 square miles in eastern and east coastal Maine. BHE is a member of the New England Power Pool and is interconnected with other New England utilities to the south and with the New Brunswick Power Corp. to the north. Visit us at [www.bhe.com](http://www.bhe.com).

About Emera Inc.: Emera Inc. (EMA-TSX) is a diversified energy and services company, with 550,000 customers and \$4.0 billion in assets. The company has two wholly-owned regulated electric utility subsidiaries, Nova Scotia Power Inc. and Bangor Hydro-Electric Company. Nova Scotia Power supplies over 95% of the electric generation, transmission and distribution in Nova Scotia. In addition, Emera Energy manages Emera's growing gas infrastructure investment portfolio, including its 12.5% interest in the Maritimes & Northeast Pipeline, which delivers Sable natural gas to markets in Maritime Canada and the northeastern United States and an 8.4% interest in the Sable Offshore Energy Project offshore platforms and sub-sea field gathering lines. Emera Energy also incorporates Emera Energy Services, Emera Fuels, and Emera's business development activities. Visit Emera on the web at [www.Emera.com](http://www.Emera.com).

### **Electricity, money to flow along new Brascan power line**

Bangor Daily News (Maine)

May 22, 2003 Thursday All Editions, Section: A Pg. 1

Dateline: Millinocket

Electricity generated along the West branch of the Penobscot River can now flow into the New England power grid, creating a new flow of cash for a Canadian power conglomerate, it was announced Wednesday.

Work on a 25-mile-long power line and two new substations capable of transmitting 126 megawatts of electricity is complete and operational, Toronto-based Brascan and Bangor Hydro Electric Co. announced in a joint statement.

The \$17 million joint project, which took 15 months to complete, enables Brascan to sell power as a generator in the New England market. Brascan will reportedly pay Bangor Hydro, which constructed the line, the full cost of the project.

Brascan's business strategy is to own and operate high quality assets in key North American markets, said Brascan President and Chief Operating Officer Richard Legault, in a prepared statement. This

project with Bangor Hydro enhances the company's generating facilities in Maine and strengthens the reliability of the regional power supply. Brascan subsidiary Great Lakes Power Inc. purchased six hydroelectric generating facilities and 11 dams along the West branch of the Penobscot from Great Northern Paper Co. in January 2002 for \$156.5 million. The purchase included a 20-megawatt interconnection to Bangor Hydro and some rights-of-way required to increase the line's capacity to 126 megawatts. The new line runs between a substation in Chester and one in East Millinocket.

Because power flows both ways along the new line, the New England power grid will provide stable service to Katahdin Paper Co., formerly Great Northern, and the surrounding area during times when the river's flow is low.

"This is an important project for the Katahdin area", said Bangor Hydro CEO Ray Robinson in a prepared statement. "The expanded transmission capability has fueled the economy in the area and provided several jobs during the life of the project. It also provides a more flexible and reliable source of energy for the region's industrial base and will enable us to attract new businesses."

For Brascan and Great Lakes Hydro, the financial benefits of the new line could amount to at least \$15 million a year if it sells all the power produced at wholesale rates of 4 cents per kilowatt hour. Brascan is a real estate, power generation and asset management company with \$15 billion of invested capital. It owns 39 power generating properties in North America. Brascan also owns Katahdin Paper Co., having recently purchased the paper mills in Millinocket and East Millinocket for \$103 million.

Bangor Hydro Electric Co. is a utility wholly owned by Emera Inc. and serves a population of 192,000 people in an area encompassing 5,275 square miles in eastern and east coastal Maine. It is a member of the New England Power Pool and is also interconnected with New Brunswick Power Corp. in Canada.

Emera is a diversified energy and services company with \$4 billion in assets and 550,000 customers. In addition to Bangor Hydro, Emera also owns Nova Scotia Power Inc.

LOAD-DATE: May 23, 2003

**Appendix 4 March 27, 2002, Bangor Hydro-Electric Company Release (cosine = .72 with April 1, 2002 article in *Electrical Week*.)**

**Bangor Hydro Announces First Phase of Company Restructuring**

March 27, 2002

For more information contact

Alison Gillan, Manager, Corporate Communications, Emera Tel: (207) 941-6608 cell: (902) 483-1516

Bangor, Maine, March 27, 2002

Bangor Hydro-Electric today announced to employees the first phase of its planned restructuring. The restructuring is part of the Company's efforts to develop a long-term strategy, which includes a commitment to provide stable rates for customers for the next six years.

We are re-focusing the company around its core strengths in the areas of transmission and distribution and we are committed to maintaining and improving services for customers, says Carroll Lee, President and COO of Bangor Hydro. We are working with employees to minimize the restructurings impact, where possible, by exploring options with other subsidiaries, and by using early retirement and severance packages.

Key to the restructuring is the formation of two streamlined business units: T&D Asset Management and Business Services. T&D Asset Management is focused on all aspects of transmission and distribution planning, engineering and operations, including construction and maintenance. Business Services provides all of the support services for the company, including customer services, financial services, information technology and human resources.

The restructuring also includes a new focus on Bangor Line Company, a non-regulated subsidiary of Bangor Hydro. Bangor Line will become a transmission and distribution services firm available to provide design, engineering, outside electrical and line work and meter reading for Bangor Hydro-Electric and other companies. Bangor Line offers a way to provide flexibility for the regulated Bangor Hydro to adapt quickly to changes in its business environment and reduces the negative impact of employee job loss by creating more than fifty jobs.

It is expected that Bangor Line will become an active and successful business by offering competitively priced T&D services, delivered by highly skilled professionals, says Mr. Lee. Some employees who currently work for Bangor Hydro will have an opportunity to bring their skills and expertise to this company. As part of the restructuring, an Early Retirement Plan was offered this week. 71 of Bangor Hydro's 425 employees are eligible to take advantage of this offer. Further details of the restructuring are still being developed and will be communicated with employees as plans are finalized.

In February Bangor Hydro and Emera Executives met with the Maine Public Utilities Commission to begin discussions toward an Alternate Rate Plan (ARP) that would see Bangor Hydro freeze its distribution rates for six years, effective January, 2002. The resulting revenue shortfall of about \$6.4 million annually necessitates a reduction in operating costs of about 20%, requiring this significant restructuring within the Company.

About Bangor Hydro Bangor Hydro ([www.bhe.com](http://www.bhe.com)) is an electric utility wholly owned by Emera Inc. Bangor Hydro serves a population of 192,000 in an area encompassing 5,275 square miles in eastern and east coastal Maine. Bangor Hydro is a member of the New England Power Pool and is interconnected with other New England utilities to the south and with the New Brunswick Power Corp. to the north. Visit Bangor Hydro at <http://www.bhe.com>.

About Emera Inc. Emera Inc. (EMA-TSE) is a diversified energy and services company, with 550,000 customers and \$4.0 billion in assets. The company has two wholly-owned regulated electric utility subsidiaries, Nova Scotia Power Inc. and Bangor Hydro-Electric Company. Nova Scotia Power supplies over 95% of the electric generation, transmission and distribution in Nova Scotia. Bangor Hydro provides electricity transmission and distribution service to 110,000 customers in eastern Maine. It is a member of the New England Power Pool, and is interconnected with the other New England utilities to the south and with New Brunswick Power to the north. In addition, Emera Energy incorporates Emera's business development activities, and manages its growing gas infrastructure investment portfolio, including Emera Fuels, which delivers bunker oil, diesel fuel and light fuel oil throughout the Maritimes a 12.5% interest in the Maritimes & Northeast Pipeline, which delivers Sable natural gas to markets in Maritime Canada and the northeastern United States and an 8.4% interest in the Sable Offshore Energy Project offshore platforms and sub-sea field gathering lines. Visit Emera on the web at [www.Emera.com](http://www.Emera.com)

**BANGOR HYDRO TO CUT STAFF BY 37%, CREATE NEW T&D, BUSINESS SERVICE UNITS**

Electric Utility Week (formerly Electrical Week)

April 1, 2002, Section: Management Pg. 11

Bangor Hydro Electric announced a major restructuring plan March 27 under which it will cut up to 160 jobs, or about 37% of its staff, and divide its regulated utility operations into a transmission and distribution asset management unit and a business services unit.

Bangor Hydro -- acquired by Nova Scotia-based Emera last October -- said the savings from the plan would reduce operating costs by 20%, or about \$ 6.4-million/year, allowing the company to avoid asking state regulators for a rate increase and freezing rates for six years.

An unregulated subsidiary called Bangor Line will also be launched to provide T&D design, engineering and construction services and meter reading services both to Bangor Hydro and outside customers. It would also be under contract to provide storm damage repairs.

Bangor Hydro believes the new group will provide more flexibility and allow the regulated operations to adapt more quickly to changes in the business environment.

The company said that it has already proposed early retirement packages to 71 of its employees but has not yet receive responses. It will cut another 89 utility jobs, but the new Bangor Line may hire up to 45 unionized workers dropped by the other units as well as several non-unionized staff.

Bangor Hydro requested a \$ 6.4-million, roughly 11%, rate hike from the Maine Public Utilities Commission late last year, but in February it withdrew the proposal and promised to draw up a cost cutting plan after the commission threatened to audit the utility.

The PUC is expected to decide in late April whether to accept the new plan or go ahead with an audit. The PUC will also have to approve the formation of Bangor Line and any service contract between the new company and the utility.

Bangor Hydro officials said they have begun discussions with the PUC and other state groups about the plan and hope to win approval in April.

Bangor Hydro serves 119,000 retail users over a 5,275 square mile area and consumer representatives in the state immediately questioned whether the company could keep up service standards while cutting so many jobs. Company officials vow to maintain current high service levels under the plan.

In another development, Bangor Hydro president Carrol Llee announced March 21 that he would retire this summer. Lee, a 32-year veteran of Bangor Hydro, assumed the top job in October, 2001 at the time of the Emera takeover, replacing Robert Briggs. Lee gave no specific reason for his decision to leave.

Emera will ask the Bangor Hydro board to name Ray Robinson, currently Emera vice president for utility integration, to be Bangor Hydro chief operating officer, effectively replacing Lee. Robinson has been involved in Bangor Hydro operations since the merger was completed. Observers in the state speculated that the increased direct intervention by Emera management in local Bangor Hydro issues -- including the restructuring and getting state approvals for a controversial new transmission link to New Brunswick -- may have led to Lee's decision to leave.

Earlier in the year, Emera transferred management of the stalled transmission line project away from Bangor Hydro managers to Chris Huskilson, an Emera vice president in who runs its large Nova Scotia

Power subsidiary.  
URL: <http://www.platts.com>

**Appendix 5: June 6, 2002, Bangor Hydro-Electric Company Release  
(cosine = .63 with AP article June 6, 2002)**

**Maine Public Utilities Commission Approves Bangor Hydro - Electric's  
Alternative Rate Plan**

June 06, 2002

For more information contact

LuAnn Williams, Communications Officer, Bangor Hydro-Electric, (207)  
941-6651 or Judy Steele, Director, Investor Relations, Emera Inc.,  
(902) 428-6999

Bangor, ME: Bangor Hydro-Electric (BHE) today announced that the Maine Public Utilities Commission (PUC) has approved an Alternative Rate Plan (ARP) effective immediately through December 31, 2007.

This Alternative Rate Plan includes scheduled decreases in the Distribution component of BHE's rate of approximately 12% over the term of the Plan. Bangor Hydro is committed to providing stable and predictable rates to its customers and I'm confident that our customers will be very well served by the implementation of this Plan. says Ray Robinson, Bangor Hydro's Chief Operating Officer. The first rate reduction will occur on July 1, 2003.

The Plan also includes provisions to ensure that service quality is maintained or improved. A renewed focus on the customer through resource management strategies designed to maintain or improve service levels is a top priority, notes Robinson.

The ARP negotiation was a collaborative process and we would like to express our appreciation to all the involved parties for their efforts in bringing us to this positive final result, states Robinson.

An audio transcript of the PUC deliberations is available on their website at: <http://www.state.me.us/mpuc/audio.htm>

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**PUC says approval of Bangor Hydro plan should bring customer savings**

The Associated Press State & Local Wire

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June 6, 2002, Thursday, BC cycle

SECTION: State and Regional

LENGTH: 404 words

HEADLINE:

DATELINE: AUGUSTA, Maine

BODY:

State regulators signed off on a negotiated deal Thursday that is expected to produce modest price reductions for Bangor Hydro-Electric Co. customers.

Approving a 5 1/2-year alternative rate plan, the Maine Public Utilities Commission also canceled a pending management audit of the company.

Sometimes, as here, the threat of regulatory intervention into a utility's management can be as effective as the intervention itself, said Commissioner Stephen Diamond.

Commission officials said annual rate changes beginning on July 1, 2003, applying to the distribution portion of customer bills, could produce a total reduction of about 12 percent over the term of the plan, which would run through Dec. 31, 2007.

The plan benefits customers by ensuring price decreases, barring major unforeseen events outside the control of (Bangor Hydro), for the next several years, Commission Chairman Thomas Welch said in a statement announcing the panel's unanimous approval.

The plan also gives the commission the ability to measure the quality of service provided to Bangor Hydro customers and to impose financial penalties should service quality prove to be substandard, Welch said. The plan, which establishes performance standards for service reliability and customer service, had been brought before the commission in a stipulation signed by the Maine public advocate's office, Bangor Hydro and Georgia Pacific and had been endorsed by the commission's staff.

The company's request for a sixth rate hike in as many years prompted discussions that led to a proposed agreement.

We believe that the threat of the commission audit, combined with the substantial public outcry against the rate increase proposed by (Bangor Hydro) last fall, has contributed to achieving a resolution to this case that is clearly in the public interest, Diamond said Thursday.

The stipulation includes provisions for adjusting rates if return on equity on the company's distribution investment for any calendar year exceeds 17 percent or falls below 5 percent, commission officials said. Earnings sharing will not apply to earnings during 2002 and will begin to be calculated in 2003 for inclusion in the 2004 price change. Commission officials said the first two basic rate changes are reductions set at 2.5 percent for 2003 and 2.75 percent for 2004. Subsequent changes will depend on the level of inflation.