The Industrial Chemist and Chemical Information: The Human Ear as a Medium*

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A unique 30-minute "audio" program is used to disseminate chemical information. The program is intended to improve communication between research laboratory personnel and top management by presenting R and D news in listening format. How news is gathered and how the "scripts" are written, recorded, and copies made are described. Some cost data and an evaluation of the success of the program are presented.

Until very recently, the principal modes of communication between research and development management and top management have been conversations (either face to face or via phone calls), letters, and, to a very large extent, written reports. What can be done to make communication even more effective?

To further help assure that the information generated is properly received and acted on, Olin has developed an additional, supplementary mode of communication—a monthly, audio cassette, news service covering internal research and development.

Of course, audio news cassettes are not totally new. For example, there is the American Chemical Society's *Chemical Executives AudioNews* which started early in 1970. (This service has been suspended.) There are, reportedly, medical cassette news services intended for physicians, and there is at least one comparable service in the computer field. It is believed that the development described in this paper is novel as a means of communicating in-house research and development news and achievements to top level chemical executives.

Our monthly audio report as originally conceived consists of two parts: The highlights of research and development achievements during the month and an in-depth feature story on a significant research and development achievement. It complements the other methods of communication which continue to be available, at least for the present.

The tapes are disseminated to a carefully selected list of about 55 key people throughout Olin Corporation.

ADVANTAGES

We believe that our audio tape report has at least four advantages:

1. It is novel. Novelty attracts attention, at least for awhile, especially if it proves to be good.
2. It may be used in so-called spare time, such as listening to it on a portable player in the executive's automobile on the way to or from work, which is the way the service is intended to function.
3. The style of writing lends itself to the use of emphasis, particularly in the tone and inflection of the announcer.
4. It has potentials of savings in cost and time.

HOW WE DO IT

The steps followed in the construction of audio-based research news at Olin are:

1. The topics to be covered are selected. This choice is usually made by the Vice President for Research and Development, Dr. W. E. Hanford, in conference with the Director of Research Administration, the Audio News Editor, and the Manager of Technical Information Services. The conference takes no more than an hour each month and also provides time for critiquing previous tapes and consideration of suggestions for improvements.
2. Once the subjects to be covered are chosen, the editor interviews key people involved in the work, usually laboratory people. This can involve anywhere from 1 to 6 or more individuals. Interviews are taped and then transcribed. Any questions arising are then clarified. This collecting of information takes 5–15 hours per month.
3. The script is written. This is time consuming—on the order of 20–45 hours a month, depending on the complexity of the topic. The script is specifically written for the ear and the style is informal. Names of people are emphasized—there are no anonymous inventors. Because quite often top management or their principal associates are not research chemists or research chemical engineers, the technical language of the laboratory is translated into layman's terms, much like science news stories which appear in *The Wall Street Journal* or, for example, in a major newspaper like *The New York Times*.
4. Accuracy and suitability of the script is assured through review before taping. This review is done first by the technical personnel specifically involved in the projects covered; second, by the Director of Research and Development; and third, by the Manager of Technical Information Services. The review is not only for technical content but also for content consistent with easy listening or "hearability" and takes 2–3 hours each month.
5. Before the announcer makes a recording, he reads and rereads the script marking areas of emphasis, inserting audio listening aids if necessary, and doing such things as verifying pronounciation of proper names. Since high fidelity or stereo equipment is not used, chemical names need special care in enunciation. For example, "chlorine" must be carefully dis-

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tinguished from "fluorine," and care taken to distinguish between "phenyl," "methyl," "ethyl," and the like. In any event, this preparation takes an hour or two per script.

6. Recording is done in an office where there is some resonance but where there is no echo or distracting noise. This involves such things as taking the phone off the hook and turning off a noisy air conditioning unit prior to recording. The announcer works in conjunction with an engineer who operates the recorder. A typical recording session for a 30 minute tape lasts 1–2 hours. This includes allowing time for listening to the quality of part or all of the recording and making any retakes necessary.

7. After the recording is made, multiple electronic copies of the master tape are made, using special equipment, at the rate of 6 tapes per duplication. For the Olin circulation list, this requires about 5 hours.

Producing the Audio News tapes as described totals about 75 hours per month and salary costs are estimated to average about $600 a month.

The equipment used at Olin includes:

A Sony recorder, model TC110 (list price about $100), used by the announcer to record.

Cassette tapes made by Audio Magnetics Corp., Gardena, Calif., costing about $0.95 for a 30 minute tape—15 minutes to a side.

Playback units made by Channel Master. These units cost about $15 each and were selected because they are simple to operate, do not allow for accidental erasing, and are inexpensive. Each person who gets a copy of the news tapes on a regular basis is given a playback unit.

A recording and playback unit used by the editor to tape interviews is made by Channel Master and costs $35.

The unit used to make multiple electronic copies is made by Voice of Music and costs about $600.

Our mention of the name of manufacturers does not mean that we necessarily endorse these products, but it does mean thay have been found satisfactory for our purposes.

Total nonrecurring costs for equipment were $1500; continuing costs run about $50 per month.

USER RESPONSE

Thus far, three attempts have been made at getting feedback on user response. First, people were asked informally about their reactions to the service; second, a questionnaire was sent out; and third, an offering of a free tape of music for every two tapes returned was inserted into the highlight section of the tape. The theory behind the offer of a free tape of music was that careful listeners would hear and accept the offer, and that response would indicate the number of people using the tapes.

Feedback has generally been good. So far, only 9 or 10 people have taken up the offer of the music tape but several commented on their over-all satisfaction with the service, and it was learned that several members of the circulation list preferred to keep the tapes for reference use rather than surrender them. One comment was that the tapes were "a boon for tired eyes." It is felt here that it really takes only one or two key people who listen regularly to the tapes to more than pay for the whole project.

POSSIBLE LIMITATIONS

Of course, there are some technical limitations to chemical news on audio tape:

1. Very technical material must be enunciated slowly or listened to several times for total comprehension. As mentioned previously, laboratory language is usually translated into layman's terms but sometimes this is simply not possible.

2. With present technology, the spoken word is not reinforced with the usual video impact of the printed page and, thus, there are no formulas, graphs, or illustrations.

3. The amount of numerical information that can be presented must be limited so as not to obscure comprehension.

4. One can usually speak, or listen to a speaker, at a relatively slow speed of about 200 words per minute, versus much higher reading speeds attained by some individuals.

5. Since the tapes are confidential, they cannot be played in a public place or conveyance unless earphones are used.

6. Some people prefer to listen to the radio for news or for soft music rather than listen to tapes while driving. This necessitates the choice of another time for listening to R and D news.

7. The novelty factor may wear off. Ways for combatting this are already being planned.

PLANS FOR THE FUTURE

Plans for future uses of audio tape communication include patent alerting for laboratory chemists. This is already under way on an experimental basis, based on abstracts of patents from patent alerting services. It is believed this approach has merit for several reasons: it is very fast (no typing or similar clerical work), it eliminates the paper shuffling work that is involved in some SDI operations, and it gets around the mental block of reading a patent bulletin each month or wading through a bunch of SDI notices.

These experimental patent alerting tapes are prepared in two steps: first, selection of key patents and, second, on-the-spot ad-lib recording of abstracts. There is no script. Each patent is given a unique number to facilitate ordering the complete abstract or of the full patent.

In addition, it is planned to study a dial-up service whereby the chemist can dial a special number and get the latest news in specific R and D areas in a 2–6 minute automatic recording or via manually fed tapes.

Another promising development is in-depth tapes on technical matters of high interest to the Corporation—an audio "state of the art" review. Such tapes cover primarily data generated outside the company and are to be sent to members of task forces concerned with the matter at hand.

Another use under consideration is having strategically placed cassette players and tapes in the Chemical Information Center to help chemists learn about new chemical information tools, how to use the chemical literature, and how to use information facilities more efficiently.

Also under consideration is the coupling of the audio news tape approach with a video service, such as cartridge TV. If developments like this materialize with favorable economics, chemists can look forward with reasonable certainty to significant changes in communication patterns within the next few years.