

International Union of Pure and Applied Chemistry Vice President's Critical Assessment 2003

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1. Introduction

According to the Union's bylaws (S6.32) the "Vice President shall submit to the Bureau biennially a critical assessment of the programs and projects of *all IUPAC bodies*", the so-called Vice President's Critical Assessment (VPCA). In essence, the purpose of the assessment is to initiate discussions of measures to be taken to improve the quality of the work carried out within and by IUPAC. However, reading of the minutes from meetings years back indicates that many VPCAs filled this function to a rather limited extent, conceivably because critical observations and good proposals for improvements often were embedded in large sections of positive descriptions of ongoing activities, which drew most of the attention and naturally diluted the critical comments.

In recent years, however, the VPCAs have been more focused and dealt with more specific problems that were regarded as important to solve in order to move the Union in the right direction. This problem-solving approach was, for instance, a characteristic feature of Professor Joshua Jortner's assessment, which contained a critical analysis of how the scientific work of the Union was performed, and Dr. Alan Hayes' assessment, which analysed the relationship between IUPAC and the chemical industry, and the activities carried out by the Union's Standing Committees. This change of approach has obviously benefited the Union, because in far less than a decade, ideas first outlined in VPCAs were debated and adopted to such an extent that they paved the way for organisational changes.

The changes were considerable; during a fairly short period of time IUPAC was transformed, from a Union with fixed Commissions with a long lifetime and a rather static membership, to an organization with short-term project groups established after international peer review of project proposals. The transition was complete by January 1st last year (2002), and IUPAC is now operating in a restructured fashion, according to the so-called project-driven system.

Some people say that the restructuring looks good, but ask what the benefits are from all the recent changes. That is an appropriate and valid question, which cannot be answered properly

before the development of IUPAC is observed and analysed in the years to come. However, we know one thing for sure: The restructured IUPAC will only be able to fulfill its objectives and live up to the expectations of the global chemical community if chemists from around the world are actively engaged in addressing important global issues involving chemistry. The best guarantee for IUPAC's success is therefore solid recruitment of good and dedicated chemists to all the Union's activities.

Successful recruiting is not done by chance; planning and strategy are paramount to succeed in engaging the right group of competent volunteers in IUPAC activities year after year. A critical factor in this endeavour is good contact with the chemical community world wide, particularly with the countries that are members of IUPAC. This requires close and vivid communication with both the formal members of the Union, the so-called National Adhering Organizations (NAOs), and the chemical societies in member countries where the chemical society is not the NAO. Several relevant questions therefore surface: Are the communication and interaction, in particular with the NAOs in the member countries, good enough? Is the information supplied by IUPAC about ongoing activities and the result of its work in various media and in various connections adequate? Are the member countries satisfied with the role they and their chemists play in various IUPAC bodies, and are individual chemists from around the world eager to participate in IUPAC activities?

Some indicators suggest that the answer to most of these questions is no. Based on this observation it seems reasonable to state that the future success of IUPAC depends on improvements of the Union's interaction and communication with its stakeholders, whether the matters under consideration are related to the advancement of research in the chemical sciences, promotion of chemistry's services to the society, improvement of education in chemistry, or initiatives to advance the public appreciation of chemistry. Consequently, IUPAC's success in the future will be intimately connected to the quality of the Union's communication strategy and practises. This point of view is shared by others, as borne out by discussions and consultations with other IUPAC officers, Bureau members, chemists involved in other IUPAC activities, and chemists outside IUPAC. On this basis I decided to focus on communication, in the broad sense of the word, in my vice president's critical assessment.

2. Communication in an IUPAC Context

The importance of interaction and communication with the global world of chemistry has been recognized by IUPAC for a number of years. In fact, an extensive communication

activity is a necessity, even a prerequisite, if the Union is going to realise its ambitious vision and mission statements. This is clear from the following excerpts:

“IUPAC advances the worldwide role of chemistry for the benefit of Mankind.”

“IUPAC addresses international issues in the chemical sciences utilizing expert volunteers from its member countries. IUPAC provides leadership, facilitation, and encouragement of chemistry and promotes the norms, values, standards, and ethics of science and the free exchange of scientific information. Scientists have unimpeded access to IUPAC activities and reports. In fulfilling this mission, IUPAC effectively contributes to the worldwide understanding and application of the chemical sciences, to the betterment of the human condition.”

It is therefore natural and also reassuring that one of the long-range goals of IUPAC (goal d) is devoted to communication:

“IUPAC will foster communication among individual chemists and scientific organizations, with special emphasis on the needs of chemists in developing countries.”

IUPAC communicates and interacts with the global chemical community at several levels and in a variety of ways.

1. The most traditional communication is correspondence with the Union's NAOs. The main purpose is to inform about ongoing and upcoming activities, consult with the NAOs, and give them opportunities to express their opinions on important policy and/or scientific matters (IUPAC-NAO Correspondence).
2. Another traditional communication channel is made up of the Union's printed publications, mainly *Pure and Applied Chemistry (PAC)* and *Chemistry International (CI)*, but also information brochures (Printed Material).
3. A third way, probably the most important one from a scientific point of view, is constituted by the IUPAC-sponsored conferences (IUPAC conferences).
4. A fourth channel is electronic communication, with e-mail services and the IUPAC web page as the information vehicles (Electronic Communication).
5. Finally, IUPAC facilitates professional and scientific interaction and cooperation between individual chemists by funding projects, which fit into the Union's project portfolio as defined by existing guidelines (IUPAC Projects).

The quality of IUPAC's services to and interaction with the global scientific community therefore depends on how well the five modes of communication are being used and how suitable they are for maintaining contact between IUPAC and its stakeholders.

In a worldwide perspective the stakeholders are of course the global chemical community, with all relevant organisations and all individual chemists, but in the context of this assessment, the relevant parties to relate to are first and foremost the NAOs of IUPAC and the individual chemists in the chemical community in the Union's member countries. Consequently, an assessment of the quality of IUPAC's information services should primarily be based on input from representatives of the Union's NAOs and individual chemists from IUPAC's member countries.

On this basis measures were taken to secure as much input as possible from the relevant stakeholders in the assessment process. First, through an article in the May issue of *CI* last year (see *CI*, vol. 24, 2002, no. 4, p. 2) individual chemists were invited to contact me and tell how IUPAC can perform better as the world union of chemistry and for chemists. The response has been far from overwhelming, but some messages have reached me, which I appreciate. The second measure was to pay visits to NAOs and discuss the same fundamental question, as well as other issues, with national representatives in the perspective outlined as follows in the letter sent to the NAOs before the meeting.

“..... I believe firmly that the chemical community, including the chemical industry, and the society at large will not benefit properly from all the good work done in and by IUPAC unless the communication is improved. [.....] This challenge has to be taken seriously, and as part of my VPCA I am therefore going to visit a number of NAOs and discuss what IUPAC can do to remove communicative bottlenecks and obstacles, and how IUPAC should go about to facilitate involvement in IUPAC work of more chemists from more of the union's member countries.

In this connection I would be delighted to have a meeting with the National Adhering Organization and discuss the questions raised above in the perspective: What changes have to be done to the way IUPAC operates to satisfy [your] expectations to the union?”

The visits started in October last year, and by the time this document was finalised, meetings had been held with 18 NAOs in all parts of the world except Africa.

3. Analysis and Assessment

The following assessment and discussion are to a large extent based on input received during very fruitful consultations with a number of the Union's NAOs. However, since the VPCA is

supposed to reflect how the Vice President looks at matters, there are no references to individual NAOs and individual chemists in the document, meaning that the positions argued for and the opinions expressed are entirely those of the Vice President. Consequently, the NAOs as well as individual chemists should feel free to criticise any part of this document as they wish; that will be beneficial for IUPAC and serve the purpose of this document well.

3.1. IUPAC-NAO Correspondence

The correspondence between the Secretariat and the NAOs, both ordinary letters and electronic messages, belongs to the formal backbone of Union and is therefore regarded as important. Most of the letters are minutes, call for nominations, or other information that require consideration and feedback, but the volume of this correspondence is fairly small. In spite of this, however, there are major problems associated with it, but the nature of the problems is different for the sender and the receiver.

From the Secretariat's and therefore the Union's point of view the main problem is the low reply percentage. Even when all the 44 NAOs are contacted by mail regarding a matter of importance to the Union, it is rare to receive more than five replies. And when all the NAOs are asked and even strongly encouraged to nominate national representatives to various committees and groups, the feedback is usually not much better. Consequently, although IUPAC's officers consult the Union's members for advice, very few people are in fact involved in the decision-making process.

From the NAOs' position the main problem seems to be related to the contents of some of the correspondence. This is particularly the case for NAOs which represent countries that have barely or not at all been represented in IUPAC activities in recent years, and which therefore have little knowledge about how the organisation works and what the challenges are. Under such circumstances, valuable feedback can of course not be expected, and NAOs in this situation will most likely not reply. This is a circle that has to be broken to generate interest in IUPAC and engagement in IUPAC's scientific activities in countries lacking such traditions.

Another NAO-related problem has to do with informing the national chemical community about IUPAC and its activities. With the exception of news items about the IUPAC conferences the general impression is that most NAOs do less than expected by their chemical communities to keep their constituency well informed about what IUPAC does. The situation seems to be most gloomy in countries that have rarely had representatives in IUPAC

committees, commissions, and, recently, task groups over the years, but in addition there are particular challenges in countries where the National Academy (or an equivalent body), and not the National Chemical Society (or the largest Chemical Society in the country), functions as the IUPAC NAO. In countries where this is the situation, special measures should be taken from both the NAO and IUPAC to improve the situation (see “Electronic Communication” below). This will be in accordance with wishes clearly expressed by representatives of chemical societies and individual chemists. It should not be regarded as satisfactory when national chemical magazines, aiming at keeping their readers informed about what happens globally in the field of chemistry, contain next to nothing about the work carried out by IUPAC.

The lack of a broad geographic representation in the Union’s elected bodies is in itself unsatisfactory, but more serious are some of the short-term and long-term consequences of this “democratic” deficit. One such example is the distribution of members in committees devoted to IUPAC’s scientific work. The data compiled in Table 1 illustrates this very well.

Table 1. The membership in the current Division Committees (DCM) by country.

NAO	DCM	NAO	DCM
United States	23	China/Beijing, Poland, Portugal	5
United Kingdom	15	Canada, Netherlands, New Zealand, South Africa, Sweden	4
Japan	10	Argentina, Belgium, Finland, Israel, Slovenia, Spain	3
Germany	9	Switzerland	2
France	8	Austria, Bulgaria, Croatia, Czech Republic, Denmark, India, Ireland, Pakistan, Puerto Rico, Slovakia, Yugoslavia	1
Brazil, Italy, Russia	7	Chile, China/Taipei, Egypt, Greece, Hungary, Kuwait, Norway, Turkey	0
Australia, Korea	6	Total NAO Members	164

This is a circle that has to be broken if more engagement in IUPAC’s scientific activities is to be generated in countries lacking traditions for participation in such work.

3.2 Printed Material

Unlike *PAC*, which is a scientific journal with a long tradition, a characteristic profile, and a good and improving standing, *CI* and special brochures are published to inform people less acquainted with IUPAC about the Union's activities and initiatives. *CI* and IUPAC brochures must therefore have the overall quality required to move the attention of occupied individuals from something else to IUPAC.

Regarding *CI* the general impression is that the readers find it increasingly attractive. There is no doubt that the chemical community has noticed an improved quality the last couple of years and now views the magazine as "informative and interesting", "much more useful than it used to be", and "a publication I am looking forward to receiving". However, there is room for improvement; for instance, there is a demand for thoughtful interviews with leading figures in the global chemical community such as Nobel Laureates, contributions with challenging perspectives on ethical and other chemistry-and-society issues, and informative articles about the importance of chemistry in other sciences. I was pleased to see the new design and layout in January, with the use of one colour each issue, including some full colour photos. Consequently, it is fair to say that *CI* is moving in the right direction.

IUPAC's brochure portfolio, on the other hand, is less highly regarded by many of the stakeholders, and I think that are good reasons for such a judgment. It is an exaggeration when it is said that there has been no target group for any of the brochures published by IUPAC lately, but there is no doubt that the most recent brochure made to inform the chemical industry about IUPAC was off target. It is therefore noted with satisfaction that the Secretariat has started to review IUPAC's information material and is currently working to improve the quality of the Union's information to the chemical industry. With such printed information available fairly soon, a national drive in the member countries to recruit more company associates should be planned to take place in the not too distant future.

3.3 IUPAC Conferences

The biennial IUPAC Congress and a large number of IUPAC symposia and conferences are well established and highly regarded, and belong to the very backbone of the channels used to communicate high-quality research findings in the chemical sciences. During the 2000-2001 biennium IUPAC sponsored 52 conferences, which were held in 28 countries and covered a range of topics in all fields of chemistry. The IUPAC financial contribution to these meetings

is small, but the support to conference organisers in emerging countries, conference participants from emerging countries, and young chemists from any country through the IUPAC-Prize-for-Young-Chemists scheme, is most valuable and should perhaps be increased.

This quality of the IUPAC-sponsored conferences is in each case secured and maintained by the good work of an international advisory board, which is actively involved in picking the most relevant topics and selecting the best speakers. The selection is based on the scientific merits of the topics and the lectures, but there is of course also a personal, non-scientific touch to it. This touch is often rather visible. Thus, it is not uncommon that the national composition of the international advisory board is clearly reflected in the national composition of the invited speakers. Since international advisory boards very rarely have members from developing and small countries, it is extremely rare to hear invited speakers from these countries even at IUPAC conferences. It is a challenge for IUPAC to rectify this situation, a challenge that can be regarded as a strategic goal on the basis of IUPAC's long-range goal d which reads:

“IUPAC will foster communication among individual chemists and scientific organizations, with special emphasis on the needs of chemists in developing countries.”

In a very short time the IUPAC Prize for Young Chemists has become an important award in chemistry. In addition to cash (USD 1,000) the recipients receive a free trip to the next IUPAC Congress, but just as important is the recognition bestowed upon them through their association with IUPAC. Such an admiration for IUPAC is global, and this could be used better than today to promote IUPAC and its work. One idea is to establish an IUPAC Poster Prize, which could consist of a diploma and be given to the best poster(s) at the (or a limited number of) national meeting(s) under the auspices of the NAO in the member country hosting the conference(s).

The IUPAC-sponsored conferences have so far barely been utilized to discuss ideas that may be developed into a project eligible for IUPAC funding. Considering the fact that work with scientific projects in international task groups now constitutes the Union's core activity, most IUPAC-sponsored conferences can therefore be regarded as lost opportunities. This is clearly a problem that should be addressed by the Divisions as soon as possible.

3.4 Electronic Communication

The last few years IUPAC has given high priority and spent a lot of money to improve the Union's electronic performance. The efforts have paid off, and IUPAC is now running an efficient office based on e-mail correspondence and web-based presentations. The web page is updated regularly, and information about new and completed projects and other IUPAC activities appears in the *IUPAC e-News*, a complimentary e-mail newsletter sent to subscribers. The web page has a large number of visitors on a regular basis, a fact indicating that IUPAC's home page is of high quality. A proof of this quality was received last year when Dr. Fabienne Meyers received a prestigious international award for the IUPAC home page on behalf of the Union.

But in spite of the quality of the IUPAC home page, very little IUPAC information is found in the national chemical magazines published by the chemical societies in the IUPAC member countries. As a matter of fact, if announcements about IUPAC conferences are disregarded, most of these national magazines do not contain any information about IUPAC on a regular basis. That is an awkward situation that should be rectified the sooner the better. In the meetings with the NAOs, several measures aimed at achieving this objective were discussed. For instance, a first step should be to establish e-news contact with all the chemical societies in the IUPAC member countries where the National Academy (or an equivalent body), and not the National Chemical Society (or the largest Chemical Society in the country), functions as the IUPAC NAO. Secondly, it is apparent that many editors in national magazines find the news stories too long or too complex to print, and since the staffs' capacity in most magazines is limited, the result is often that nothing is published at all. Consequently, there is a demand for short, interesting, relevant stories that will draw the readers' attention and which a number of chemical societies are willing to print in English in their national magazines. These proposals (and other ideas put forward) clearly indicate that there is a genuine interest in informing about IUPAC's activities through national magazines in IUPAC member countries. This interest deserves a positive response from IUPAC.

The IUPAC home page contains a number of useful links. Among those are links to the NAOs and the chemical societies in the member countries, which are very useful if you are searching for information in an international perspective. However, a test of these links reveals that quite a few are either missing or not working. This should be rectified as soon as possible.

3.5 IUPAC Projects

In principle the project-driven system permits IUPAC to act quickly and establish task groups to address scientific issues that require international standardization (of e.g. nomenclature, terminology, and quantities) or evaluation and critical assessment of quantitative data. Any individual chemist or any group of chemists may submit a project proposal, but members of a chemical community that knows little about what IUPAC does, are less likely to become engaged in projects than members of IUPAC-aware communities. The data compiled in Table 2 support such a conclusion, and when these data are compared with those in Table 1, a general pattern seems to emerge: the countries with the highest representation in IUPAC governing bodies have most members in the project Task Groups, although there are a few notable exceptions (the Czech Republic, Hungary and India). It is therefore reasonable to conclude that if more chemists from a wider range of countries were exposed gradually to the formal operation of the Union, the geographic representation of the task groups might quite conceivably broaden, a development that will be beneficial for the global chemical community. Measures should be taken to encourage such a development.

Table 2. Distribution of the current Task-Group Membership (TGM) by country (NAO).

NAO	TGM	NAO	TGM
United States	111	Hungary, Switzerland	13
United Kingdom	66	Poland	10
Germany	54	Israel	9
Japan	46	Austria, Brazil, South Africa	8
Russia	28	Korea, Portugal, Spain	7
Australia	24	China/Beijing, Denmark, Finland	6
Czech Republic	21	New Zealand, Turkey	5
Netherlands	19	Bulgaria	4
France	18	Argentina, Slovakia	3
Canada	16	Chile, Croatia, Greece, Ireland, Norway, Slovenia	2
Belgium	15	China/Taipei, Pakistan,	1
India, Italy, Sweden	14	Egypt, Kuwait, Puerto Rico, Yugoslavia	0

As pointed out elsewhere (section 3.3) the IUPAC-sponsored conferences have rarely been used to solicit ideas that may lead to project proposals eligible for IUPAC funding. This is a challenge that should be met by the Divisions as soon as possible.

4. Proposals for Future Discussion

From the analysis in the preceding section I am convinced that IUPAC can improve in quality, increase its visibility, and become a more global organization if knowledge about the Union is increased in the chemical communities in the member countries. Measures that will increase the IUPAC awareness in these countries should therefore be introduced. By increasing the awareness it is reasonable to believe that more chemists from more countries will become engaged in IUPAC activities, a development which hopefully will be beneficial for the global standing of the chemical sciences. In order to start to move in the desired direction five concrete measures are proposed for implementation after adequate discussions.

1. Improve The Visibility of The Member Countries on IUPAC's Homepage

The links on the IUPAC home page to various national institutions in the member countries have to be checked and corrected/completed/expanded to include the NAO, the national chemical societies, and other institutions relevant to chemistry in each country. This action will improve the quality of the IUPAC network and make it easier to disseminate useful information about IUPAC to the right people in the worldwide chemical community.

2. Make IUPAC News Stories More Useful for National Chemical Magazines

It is clear that many editors of national chemical newsletters and magazines find the available news stories about IUPAC too long or too complex to print. Consequently, there is a demand for short, interesting, relevant stories that will draw the readers' attention and therefore will be printed more or less unchanged in English in the national magazines. It should therefore be considered, if deemed of interest after a survey has been carried out, to allocate resources so that someone at the Secretariat could do some editorial work and prepare shorter news stories for publication in national magazines in the member countries.

3. Appoint National Contacts (NCs) to All Divisions

The lack of a reasonable geographic distribution among the members of committees devoted to IUPAC's scientific work has been obvious for some time and is a fact of some concern. Measures should therefore be taken to facilitate the participation in such work of chemists from countries, which have rarely or not at all been represented in IUPAC activities in recent years, and which therefore have little knowledge about how the organisation works and what the challenges are. It is therefore proposed that each NAO be asked to appoint to each of the

eight Division Committees (DCs) one chemist to function as a National Contact (NC). Thus, each DC will have a group of 44 NCs associated with it. This new body is designed to improve the communications with and direct involvement of *all* NAOs. All NCs would be kept informed by e-mail of significant matters being considered by the DC and would be expected to provide suggestions and advice as requested by the DC or at the initiative of the individual NC. From time to time, some of the NCs might be asked to serve on a working party to deal with certain issues or to review project proposals. This will for instance give NCs the experience and exposure required to be elected to an IUPAC body, such as the appropriate DC, in due course.

4. Appoint National Contacts (NCs) to Project Task Groups

Most chemists involved in IUPAC projects have both IUPAC dedication and IUPAC experience. To acquire these qualities takes time, but their acquisition is conceivably facilitated by an opportunity to cooperate with dedicated members of existing project Task Groups. In order to encourage more chemists from a wider range of countries to become active task-group members, it is therefore proposed that the National Contacts to the Divisions are invited to find qualified chemists from their respective countries to function as National Contacts to relevant project task groups. These NCs would be kept informed by e-mail of the project's progress and would be expected to provide feedback and advice as requested by the task- group leader.

5. Establish an IUPAC Poster Prize

It is proposed that an IUPAC Poster Prize be established. The prize could consist of a diploma and be given to the best poster(s) at the (or a limited number of) national meeting(s) under the auspices of the NAO in the member country hosting the conference(s).

6. Improve NAO Participation in IUPAC Governance

Following the discussion of this Critical Assessment in Ottawa, the Council will take up the report of the Governance Structure Committee. I believe that implementation of the recommendations of this committee – to streamline the governance structure and to establish a Union Policy Committee with a representative from each NAO – would greatly assist in achieving the broad participation that we are seeking.