E S A S p a c e W e a t h e r W o r k i n g T e a m

Minutes of 8th Meeting, 10 April 2002
CNES, Toulouse

Attendees:

P. Cugnon, ROB-SIDC
E. Daly, ESA./ESTEC
R. Favre, Swiss Re Risk Mgt.
E. Flückinger, Physikalisches InstitutUniv. Bern
P. Gille, CNRS-LPCE
A. Glover, ESA/ESTEC
A. Hilgers, ESA/ESTEC
N. Hoffmann, ESA/ESTEC
N. Jakowski, DLR, IKN
F. Lefeuvre, LPCE-CNRS
M. Pick, Paris Observatory, LESIA
R. Pirjola, FMI
J.-Y. Prado, CNES
W. Riedler, IWF Graz
B. Sanahuja, Universitat de Barcelona
J. J. Valette, CLS
W. Verschueren, OSTC
J. Watermann, DMI

Excused:

A. Blusson, CLS
T. Clark, BGS
R. Gendrin, CNRS
M. Hapgood, RAL
A. Korth, MPI
J. J. Berthelier, CETP/CNRS

The chairman W. Riedler welcomed all the attendees and thanked J.-Y. Prado who organized this meeting at CNES.

The agenda was approved and the minutes of the previous 7th SWWT meeting in December were also distributed to those not already in possession of a copy. It was agreed that examination of the minutes and potential comments would take place later in the meeting.

1. Summary of recent events (E. Daly)

E. Daly gave a short summary of the Management Board (MB) meeting and its function at ESA. It is the highest internal body of ESA, is chaired by the Director General and consists of all ESA Directors: SCI (Science), MSM (Manned Space flight and Micro gravity), TOS (Technical and operational support), APP (Applications), EOP (Earth Observation Programmes), LAU (Launchers), SER (Strategy and External Relations), ADMIN (Administration). The ESA space weather initiative originates from the TOS directorate and specifically TOS-EMA, not from the Science directorate.

Discussion at the MB meeting itself was preceded by discussions with advisors and some directors so that everyone understood the issues prior to the meeting itself. In the science area R. Marsden and H. Opgenoorth were involved, in Earth Observation L. Marelli and in Applications, D. Faivre.

The responses received at MB varied widely. The nature of these comments ranged from the problem that space weather might suffer from having too wide a user community to it being a potential candidate for GMES.

In advance of the meeting the advisor to the Director of Applications, D. Faivre, had actioned TOS-EMA to find out who the consortia contractors had contacted for information regarding the effects space weather has on operations in Europe.

It was clear in pre-MB discussions that a wide-ranging proposal including work on space segments to follow the consortia and CDF studies would not be supported. However, the position of the MB was consistent with that of the Space Weather Initiative as defined by TOS-EMA in that it was clear that the objective of the pilot project is to extend the user community and find out whether there is justification for a larger scale programme as mentioned in the roadmap. For this reason, it was decided not to propose study of a large-scale space weather programme at the MB meeting.

Originally, a time of 10 minutes was scheduled for the Space Weather presentation at the MB but discussion continued for 40 minutes. E. Daly felt that this was a positive sign.

Some MB members were sceptical that after the pilot project is completed, there will be sufficient justification to embark on a large-scale programme. It was requested that ESA report back to the MB following completion of the pilot project with the ability to provide unbiased arguments in favour of a space weather programme if the results of the pilot project do indeed indicate the need for a programme.

The agreements made between ESA, national agencies and participants in the pilot project should have very clear perspectives. The focus will be on applications not science. An Announcement of Opportunity (AO) will now form the next step.

D/EOP stressed the need for an R&D element within the pilot project.

One of the key questions raised by the MB was how to organise the activities of the Pilot Project.

After the AO phase ESA will report back to the MB.

In the view of one director, the US programme is built largely on the needs of the military and manned programmes, both of which are lacking in Europe He felt that the European coordinated military landscape is not yet sufficiently advanced and interest will not be strong enough in a space weather service.

Coordination with the needs of manned missions and coordination with ESA's D/MSM was recommended.

It was suggested by one director that Space Weather may be a topic to be considered within GMES. This point had also been raised at pre-MB discussions with the D/EOP representative who suggested it should be presented at the GMES workshop

scheduled to take place in June. F. Ongaro will try to insert Space Weather onto the agenda.

W. Verschueren enquired whether the timescales discussed here are still compatible with decision making prior to the next meeting of the ESA Council.
E. Daly replied that this is not a goal in the context of the pilot project, but it would be compatible.

W. Riedler enquired about the level of interest in space weather expressed by the ESA telecommunications representative present at the MB.
E. Daly stated that telecommunications fall within the remit of the ESA Applications Division. They were interested but remained neutral. Their main interest lies in the effects on their communication satellites and Galileo. Such limited interest would not provide sufficient justification for a large-scale programme on its own
W. Riedler expressed disappointment at this response.
E. Daly replied that the Directors also have financial issues and boundary conditions to consider.
J. Y. Prado drew comparison with CNES where in discussions with several directors similar attitudes were encountered. He queried the number of board members with detailed understanding of space weather.
E. Daly responded that the MB includes D. Southwood and J. Achache who are both very familiar with the topic.

J. Watermann commented that Europe might be facing such difficulties owing to the existence of a US Space Weather programme. He suggested that more emphasis should be placed on the benefits a European programme could bring. For example more recent warnings would be possible if forecasting was also done within Europe.
It was stated that this issue has been addressed in past activities and will be addressed in more detail as part of the Pilot Project.

The point was raised that the provision of services for power or oil companies may fall outside ESA's remit.
E. Daly felt that this argument might lead to closer coordination between ESA and the EU.

M. Pick asked if the possibility of coordination with the EU had been discussed with the MB, as this point has been mentioned at earlier SWWT meetings.

F. Lefeuvre enquired as to the response of the MB to the strategy of pairing service providers and users.
E. Daly stated that the MB thought it a good way to proceed, with the proviso that the objectives of these groupings were more clearly defined. This requirement arose from their concern that the Pilot Project may have a vested interest in providing a positive result.

F. Lefeuvre commented on the statement by E. Daly that the MB had expressed concern that several major European satellite operators were not contacted by the Alcatel and RAL consortia. Major players mentioned at MB were Eutelsat, Hispasat, Astra and military operators. One might also add Inmarsat.
E. Daly thought it unfortunate that contractors had not covered this satisfactorily.

E. Daly stressed that the aim of the Pilot Project will be to address these users, educate them in the nature and risks of space weather and develop services tailored to their needs.

E. Daly briefly explained the proposed organisation of the Pilot Project, as was presented to the MB.

The project will now proceed with an AO. This will lead to the selection of up to 15 projects, which shall be co-funded up to a maximum amount of 100K by ESA. In order to qualify for this funding the contractor will need to demonstrate that they are able to provide an equal amount of funding from an alternative source. Other projects not requiring ESA funding could also be networked.

Following this SWWT meeting a letter will be sent to the European space weather community to inform them of the upcoming AO and plan for a pilot project. This will allow for early preparation, especially of co-funding.

The pilot project will also include a detailed economic analysis. Following completion of the Pilot Project, we should be able to estimate the potential value of a European Space Weather programme to the European community together with the benefit already brought by pilot project activities. The only way to fund such an *applications* programme within the agency is to prove that you have users who would benefit. This might also incorporate social and health benefits together with financial gain.
In addition to the 15 co-funded projects, one or two contracts will be released to provide an overarching network structure linking the activities of the individual projects.

ESA was asked why the number 15 had been selected as the number of contracts to be issued.
E. Daly replied that 2ME was originally requested for this activity. It was later decided that 0.5ME should be awarded for the contract which would provide the network structure and the remaining funds would be allocated to individual service contracts.

N. Jakowski suggested that the major space weather topics could be defined and the amount of money for each contract weighted according to the importance of the service.
E. Daly agreed, but 100KE per project was the limit set. Exceeding this amount might cause difficulties within ESA. However, there may not necessarily be 15 space weather domains. For example, 3 projects developing different services but relating to the same field might be funded.

M. Pick requested more information about the concept of networking for exchanging data. She expressed concern that some projects will require close cooperation with the USA owing to data exchange. Would this lead to difficulties in obtaining ESA funding? E. Daly stated that the pilot project will need to be based on existing data sources and as such data originating from outside Europe will undoubtedly be used.
M. Pick further enquired whether it would be possible to propose co-funding from the USA, European industry, China or Australia.

E. Daly replied that industry funding is very welcome. However, there may be difficulties in non-member state co-funding. ESA will try to evaluate each proposal on merit.
J. Watermann pointed out that the AO was limited to service providers and asked whether co-funding from the service provider would be acceptable.
E. Daly stated that the more willing European industry is to co-fund the pilot project activities, the better the demonstration of a user community

J.-Y. Prado underlined that it will take more than a few months to confirm industrial commitment.

E. Daly stated that this is understood and that the definition of "co-funding" could be quite flexible - e.g. the allocation of already funded manpower could also be considered co-funding.

The contract which will form the common infrastructure and economic element of the Pilot Project was referred to as 'glue'. Co-funding would also be welcomed in terms of this contract.

J.-Y. Prado asked where the users are foreseen to be within this structure.
E. Daly stated there are two types of user. The general public will be aware of Pilot Project activities through the main contractor who will be responsible for public relations activities. Users of actual space weather products will be integrated into the 15 service contracts.

2. Roadmap review (E. Daly)

Following the management board meeting the roadmap will need to be reworked for the Pilot Project. The updated document should only refer to the next 3 years (as approved) and not 10 years, although the follow-on can be outlined as "options". In earlier versions of this document it was stated that we would focus on elements of the space segment studies carried out by the Alcatel and RAL consortia and the CDF study. This will not now be considered until after the pilot project has been completed.
The CDF report will be available on the SWWT site but hard copies will be posted to SWWT members on request.
B. Sanahuja asked why ESA is focusing on international collaboration with NOAA. He pointed out that part of the NOAA space weather activity is also connected to NASA.

E. Daly said ESA is not exclusively focusing on NOAA. The NASA Living with a Star programme incorporates an application element and space environment test beds.

Aside:

As agreed at the beginning of the meeting, W. Riedler asked for comments on the meeting minutes from December.
They were adopted with no changes.

B. Sanahuja requested an addition be made to the SWWT-M7 minutes (point 3 Summary of Alcatel presentation/ last paragraph/ comment by T. Clark stating that

only a 20 minute warning of SW effects is possible after processing an event observed 1hour in advance.)

"*It is possible to observe SEPs two days in advance. There is, however, not a linear relationship between these observations and SW effects, although some indication is provided of later activity. "*

3. **Pilot Project Issues (A. Hilgers)**

Appendix 1: The Pilot Project Proposal

W. Verschueren mentioned that the next Eumetsat PAC meeting will take place in Darmstadt, 30-31 Oct 2002.

A. Hilgers began by summarising some of the main issues raised during the discussion of the pilot project (Appendix 1). First, unlike the USA where the military is a major user of space weather services, there is a need to define clear economical benefits for such a service in Europe.

Second, the already established, free and publicly available NOAA SEC service is the most accessed data provider amongst both American and European users. As a result, the benefits of creating a European service in parallel must be clearly defined.
The pilot project will include the establishment of a network of users and service providers. This will encourage communication between widely varying domains not usually in contact. This will be facilitated by the development of a common software infrastructure through the overarching network contract.
R&D activities will be created based on the development of space weather applications.

It was stressed that the user should remain critical regarding the level of service provided through the pilot project. The MB will consider the user evaluation in the context of any future funding for space weather activities.

A. Hilgers presented preliminary lists of 12 existing service providers and about 18 groups within Europe with the expertise for becoming a service provider in the near future. The SWWT members were asked to provide inputs to complete the list. B. Sanahuja was asked if he considers himself a provider.
B. Sanahuja stated that the service his institute offers is still under development.

E. Daly underlined again the need to ensure community awareness of the pilot project as soon as possible.

W. Verschueren suggested that we focus on a limited number of pre-defined institutes or projects that the SWWT would like to see financed in the initial AO. Some results will be needed 1 year after the contracts begin if we wish to present space weather activities at the next ministerial meeting in 2003. However, it will be necessary to scrutinise proposals & also leave door open for new ideas that haven't been anticipated by ESA. In this case, the number of projects to be financed should not be dependent on the number of institutes. He also felt we should increase funding for individual projects. Themes might need more money. He felt that 100KE per project

would not be sufficient in order to achieve the results ESA and the SWWT are hoping for. The achievement could be better with more than one contract awarded to contracts focussing on the same subject.

E. Daly agreed. For example, if 3 good projects are submitted in 1 domain that means it is a good candidate for space weather services & excites a lot of users. It may be possible to integrate the three projects somehow such that 300KE funding is then available for one field.
W. Verschueren felt that the results of the pilot project might appear scattered when presented to the management board in 2 years time. This structure will lead to many small projects which, when presented, may not appear as effective as fewer well developed services.
A.Hilgers replied that the idea of focussing on a reduced number of items is nice in principle, unfortunately neither consortium nor the SWWT have to date been able to specify which service would be the most important.
It was agreed that no decision on any potential restrictions should be made before responses are received to the AO.

The list of current service providers will be on the ESA space weather web server and not included in the AO.

A.Hilgers stated that the AO should be issued by June.

ACTION (AH)
Prepare AO Document for issue in June

Prior to the 15th April an information letter will outline the content of the pilot project, the AO which will call for individual service contract proposals and the following Invitation to Tender (ITT) which will call for the network and economic element of the pilot project. New structures will also be discussed. This will include a restructuring of the SWWT.

ACTION (ED)
Finalise information letter for issue on 15th April

E. Daly asked the SWWT for their views on the organisational structure of the pilot project. A chart showing an alternative structure proposed by F. Ongaro was presented.

It was pointed out that there has been some internal ESA discussion regarding the organisation of these contracts and that it was very important to have SWWT views on the organisation. E. Daly presented the alternatives, their advantages and disadvantages.

One alternative was to have all service projects (the 15 successful AO replies) as sub-contractors to a main infrastructure contract. This would be administratively simpler for ESA as there would be a single formal responsible. However, the co-funding authorities may not like this "sub-servience" implied.

Another alternative was to have a direct contract with ESA for each of the service projects a separate contract for the "glue" and for the economic analyses, making a total of 17 contracts. ESA would then be responsible for of the main part of the coordination and this could lead to difficulties..

Both proposed structures propose that, following the AO, a steering board will be formed. This will consist of ESA and its funding partners. Partners may include national agencies and others.

F. Ongaro's proposed structure defines the 'glue' as a provision of support services to the network partners. ESA sees this as easier to manage. The contractor would provide the public face of an integrated system.
W. Verschueren commented that a similar argument is currently taking place within the GMES project management.

J.-Y. Prado noted that difficulties may arise in co-funding if the individual service contracts are subcontracted.
W. Verschueren replied that co-funding should take place by agreement. He favoured the approach by which the service contracts would be dependent on an integrator. In this manner, individual projects could be combined more easily.
A.Hilgers expressed concern that that the views of the integrating contractor may be too strong leading to a biased result.
F. Lefeuvre enquired whether it would be more efficient to define the pilot project structure in detail after the main contract has been selected. The main contractor could then choose his/her level of responsibility.

J. Watermann assumed that the main contract would be weighted according to funding. He enquired as to the level of responsibility given to the main contractor.
A. Hilgers replied that the main contractor should not have a decision-making role. Coordination will always take place in agreement with ESA.

E. Daly pointed out problems with F. Ongaro's proposed structure. Under this arrangement, no contractual agreement will exist between the main contractor and the individual service contractors.

In addition, under this system, co-funding will be complex and in some cases, co-funding bodies may be unwilling to see service providers acting as a subcontractor to the main contractor who may be a commercial entity.

J. Y. Prado felt that the presentation showed the possibility to merge both technical and administration roles of the Pilot Project.

W. Verschueren expressed doubt that 15 separate service contracts reporting directly to ESA would be a viable approach.
N. Jakowski proposed that the number of contracts funded be reduced.
E. Daly posed the question that if 3 GIC projects were proposed together with 3 different co-funding agencies, would they all agree to be grouped into the same project?
J. Watermann suggested that it might be possible to ask people with similar subject proposals to pool their resources and write a combined proposal for a larger project.

W. Verschueren again recommended funding one project per subject. In addition, projects involving more than one institute could be favoured.
P. Cugnon suggested that subject groups might be created.
E. Daly noted that F. Ongaro has already raised the concern that if there was only one contract per field, the risk would exist that this contractor be in a position where he/she has a monopoly on that type of service in the future.
E. Daly noted that he will need to inform the ESA contracts department how many contracts will need to be created.

It was noted that the discussion was moving in favour of direct contracting rather than a single contract and 15 sub-contracts. It was therefore recorded as a SWWT recommendation.

SWWT RECOMMENDATION

direct contracting should be the preferred method as suggested by F. Ongaro

ACTION (ED)

Inform ESA Contracts department and management of the recommended approach

E. Daly stressed that the SWSB will not be a renamed SWWT. The SWSB will consist of ESA and its co-funding partners. Automatic entrance to the board will be given to all co-funding bodies.
E. Daly expressed the need to identify the largest market for a European space weather programme. This is currently thought to be in Scandinavia. For example, aurora predictions are produced by IRF-Lund for the tourism industry.

F. Lefeuvre commented on the advantages of involving national delegates in the pilot project project.
W. Verschueren proposed inviting some delegates to sit on the SWSB as observers.
E. Daly agreed on the importance that national delegations are made aware of the pilot project activities. It was stated that they should be encouraged to attend the next IPC meeting and express support. Attention should also be focussed on the SPC, SSAC, PBEO and ultimately the ESA council.

A. Hilgers stated that an internal review panel will evaluate the responses received following the AO.

4. **Future of SWWT (A. Glover)**

Appendix 2: Updated SWWT Terms of Reference

A. Glover gave a presentation on the future of the SWWT stating that it will undergo some restructuring following the release of the pilot project AO. Restructuring will allow the SWWT to become more open. It will take the form of a technical discussion forum providing technical input to the SWSB.
W. Riedler asked what the term “technical input” means

A. Glover stated that technical input might take the form of reporting new space weather related scientific or technological advances. In addition, the SWWT would report on the reception of the pilot project amongst the space weather community.

R. Pirjola enquired about the policy for membership. He suggested that the structure might be more efficient if every company or agency were asked to nominate only one or two representatives.
It was pointed out that at present, most attendees come from a scientific background so we should aim to involve more members of the user community e.g. from a telecommunications background.
J. Waterman proposed that user feedback be collected separately as this might interfere too much in technical discussion.

J. Watermann asked for clarification of the Pilot Project's position with regard to science.
E. Daly stressed that the pilot project is not a scientific research project. The project under discussion is an *applications* project geared towards providing services for users. No scientific research will be funded as part of the pilot project but monitoring developments in space weather related science will be important throughout the project, especially in the context of developing applications.

Future SWWT meeting agenda will be sent out well in advance of meetings. These are to be prepared by the chairman with the help of the coordinator.

Concerning the proposed open membership, E. Flückiger enquired whether Pilot Project participants will be allowed participate in future SWWT meetings.
E. Daly replied that certain areas may be confidential.

F. Lefeuvre felt that until now the SWWT chairman had not been sufficiently involved. He cited previous occasions where the consortia had reported their activities to ESA but ESA had neglected to inform R. Gendrin (former chairman) prior to the meeting taking place. This led to confusion.
W. Riedler volunteered to continue acting as a chairman. He pointed out that he also sits on the SPC of ESA.

It was appreciated that W. Riedler remain Chairman during the SWWT transition period, to include new duties set out in the terms of reference (Appendix 2). Following finalisation of the updated SWWT/TOR it will be necessary to proceed with formal election of a chairman.

ACTION (AG)
Update SWWT/TOR with duties of chairman

W. Verschueren enquired whether the SWWT would also be renamed.
E. Daly stated that the name Space Weather Working Team will remain but any decisions will now be taken by the SWSB.

P. Gille stated that inclusion of EU representatives in future SWWT meetings would be important.

E. Daly stated that EU representatives are always welcome but difficulties have been encountered on previous occasions in identifying an individual to attend the meetings.

W. Riedler mentioned the proposed SWWT meeting in Alpbach on 1st-2nd August 2002. This would be arranged to coincide with the final day of the Alpbach Summer School 'Space Weather: Research and Applications'. Students taking part in the summer school will carry out space weather related projects and present their findings to the programme committee on the final day.
It was proposed that the SWWT should attend the summer school final presentations, to take place on 1st August, in order to view the work done by the students. This would be followed by one half-day meeting on the 2nd August, during which SWWT business will be discussed.
W. Riedler also expressed the concern that the lecture programme of the summer school is too scientific.

A. Glover asked for proposals for new SWWT members. It was decided that a call for new members be issued via SWEN following the release of the AO.

ACTION (AG)
Prepare call for new SWWT members to be issued through SWEN

W. Riedler asked who will take up the post of deputy chairperson. A decision will be made following the AO. In the transition period A. Glover will act as deputy chairperson.

5. Proba II Announcement of opportunity (E. Daly)

Appendix 3: Proba Call for Ideas

It was reminded that a call for ideas for PROBA II had already been issued, the deadline for which is the 13th April.
It was suggested that PROBA II might act as a testbed for space weather key technology. The SWWT members were asked if there are currently any mission ideas relating to space weather.
The CDF study found that one of the main problems in defining a space weather space segment with real-time data downlink lies in the communication infrastructure. Consequently using the PROBA II mission in order to test the communication infrastructure for a space environment satellite with real time data downlink might prove advantageous. F. Lefeuvre agreed with this idea.

P. Cugnon and F. Lefeuvre (not yet confirmed) stated that they are both currently involved in proposals. F. Lefeuvre is involved in a proposed wave experiment. P. Cugnon is involved in a proposal to include a full sun UV monitor.
M. Pick referred to the radiospectrograph which will measure frequencies up to 30MHz, proposed as part of the CDF study. That was considered as new technology by the CDF study.

ACTION (SWWT)

SWWT members aware of responses to the PROBA II AO are requested to relay this information to E. Daly.

6. Position of national representatives

1. France.

CNES has demonstrated a similar response to that of the ESA directors. Some funding had been provided for R&D activities. All funding until now has been questioned as there has been no firm decision on space weather from ESA. CNES is not planning to build its own space weather system.

2. Belgium

No new activities have taken place.

3. Germany

No new activities. N. Jakowski underlined the importance to approach representatives directly and raise individual awareness.

J-Y. Prado felt it was necessary to update the briefing pack which could then be shown to the ESA delegates. Delegates will only express an opinion on something produced by ESA.

E. Daly informed the SWWT that there will be an information note sent to the Industrial Policy Committee (IPC). This note should be sent before the next meeting which will take place in Capri on May 14-16th.

ACTION (ED)
Write IPC information note before 14th May

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ACTION (SWWT)
Contact delegates to arrange meeting to discuss the information note in advance of the IPC.

7. International Initiatives

Appendix 4: COST

A. Glover gave a presentation provided by T. Clark, on the proposed Space Weather COST action.

J. Watermann expressed concern that Danish institutes are often wary of taking part in COST actions as it is necessary for them to fund their own participation in meetings. He also noted that the submittal and acceptance process may be long.

The Galileo programme has been approved. Galileo represents a strong interest in Space Weather issues. The Galileo signal will be subject to space weather effects as will the spacecraft themselves.

Agreements are currently being made between ESA and the NASA Living With a Star (LWS) programme.

Appendix 5: Invitation to Submit Expressions of Interest: An opportunity for Europe's research community to help prepare for the first calls of FP6. Guide for Submitters

F. Lefeuvre raised the issue of the EU 6th framework programme for which 6th June is the deadline for submission of expressions of interest. A copy of this invitation was distributed (Appendix 5). He suggested the SWWT should ask for space weather related project proposals.

8. **Conferences and workshops**

Appendix 6: ISES

Space Weather Week will take place between 15th-19th April in Boulder, Colorado.

The deadline for the World Space Congress (COSPAR) meeting in October is 1st May. The SWWT were asked to recommend speakers for the Space Weather: Research and Applications session in order to ensure strong European representation.

M. Pick: mentioned a workshop taking place for the new American project Faser. Interest in space weather has been expressed. They hope to secure both European and Chinese collaboration.

The URSI general assembly will take place in August. Risto Pirjola and A. Hilgers will attend.

A. Hilgers presented a proposal intended to be discussed at the next ISES meeting for ESA participation in ISES. At present, SIDC Belgium, IRFL Sweden and CLS are members or associated members of ISES.

J. Watermann expressed concern that there seem to be too many independent activities ongoing including this one.
A. Hilgers replied that the purpose of this proposal was precisely to increase the interaction between the pilot project and other activities performed by European institutes as members of ISES. In addition, ISES offers a natural international framework for such interactions. The ISES strategy and the proposal was unanimously approved.