BUSHFIRE AND NATURAL HAZARD TRAINING FOR NORTHERN AUSTRALIA

Annual project report 2014-2015

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Version	Release history	Date
1.0	Initial release of document	26/10/2015

Australian Government
Department of Industry and Science

Business
Cooperative Research
Centres Programme

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EXECUTIVE SUMMARY

This report outlines progress in the North Australian Fire and Natural Hazard Training project. The project is part of a program of action research projects based at Charles Darwin University entitled "Building Community Resilience in Northern Australia". This program includes both physical and social science research into natural and cultural processes that impact upon the vulnerability and resilience of remote north Australian communities.

The Building Community Resilience in Northern Australia program has a strong focus of action research to encourage and enhance existing nodes of capability and excellence. The most prominent of these for fire and emergency management are ranger groups. These groups have grown substantially in the last decade and have built a solid base of capacity by ensuring skills, knowledge and qualifications in fields as basic as driving a car to operating GIS.

The North Australian Fire and Natural Hazard Training project aims to provide a 'next-generation' training program that builds on the current assets in the north such as the ranger programs and leads to increasing levels of competence and confidence and in its turn, resilience. The project is a response to north Australian stakeholder concerns that existing training is inadequate for their needs.

The project was late to start, but has now completed four new training units and is moving on developing further new units and, where appropriate, adapting existing units to suit the needs of northern Australia.

A key focus of the new training units is the development of a didactic approach to building an understanding of the differing world views about fire and emergency management and the ways these affect preparation and response, particularly to bushfires, but also other natural hazards.

The project has made presentations to the Wellington AFAC/BNHCRC conference, the Research Advisory Forum in Sydney and the North Australian Fire Managers Forum in Cairns in June.

A workshop for stakeholders was held in May in Darwin and a further presentation was made at a workshop of the "Building Community Resilience in Northern Australia" in Ngukurr in June.

END USER STATEMENT

Suellen Flint, *Department of Fire and Emergency Services, Western Australia*

The development of training for north Australian landscape-scale bushfire and emergency management is seen by many in Western Australia as a crucial platform for improved resilience in remote communities in the state's north. DFES has been increasing its efforts to work with land holders in the north as well as other agencies to achieve improvements in the fire regime: principally decreases in total area burnt and fire severity.

This has included the allocation of resources to provde and deliver appropriate training to remote indigenous communities. The interaction between DFES personnel involved in this program and the BNHCRC "Northern Training" project has been extremely positive and reconfirms the agency's initial support for the project. There is a strong sense among north Australian fire and emergency managers, land holders and remote community leaders that this is an idea whose "time has come".

At a number of forums in 2015 and through informal contacts it has become clear that there is a great deal of consistency of thought across the region to the effect that there *is* a need for training that is different to that suite of courses which form the core of the currently available fire and emergency management training. In part this is a response to emerging economic opportunities in fire and land management, but there is also a 'snowball' effect emerging from partnerships, both formal and informal, where different groups are finding new ways to work together, coordinating effort and approaches to achieve on-ground improvements.

While the Bushfire and Natural Hazard Training for Northern Australia project has been slow to get started, now that training units are being developed and shared for discussion with stakeholders, there is enthusiastic support for the project and anticipation of the roll-out of pilot courses in the next 12 months.

INTRODUCTION

This report outlines progress in the North Australian Fire and Natural Hazard Training project. The project is part of a program of action research projects based at Charles Darwin University entitled "Building Community Resilience in Northern Australia". This program includes both physical and social science research into natural and cultural processes that impact upon the vulnerability and resilience of remote north Australian communities.

A key driver for the "Building Community Resilience in Northern Australia" is the ongoing development of resilience through the life of the research project through two key mechanisms. The first is the inclusion of remote communities themselves in the research, so that new skills and understandings can be absorbed into the capability set of the community through the execution of research. This model has been adopted in the past by the Darwin Centre for Bushfire Research, utilizing the input of indigenous ranger groups and providing feedback and training to reinforce the quality of data capture and to provide a legacy of understanding of modern scientific techniques that can be utilized in fire and land management.

The second key mechanism for growing capacity through research is the use of indigenous researchers, particularly ARPNet, the Aboriginal Research Practitioners Network. This comprises teams of trained researchers from communities across the north who use a specially designed set of qualitative and quantitative research methods in a contracted research service. The use of ARPNet by the BNHCRC Building Community Resilience in Northern Australia" program, including the Training progam, further enhances community resilience.

Perhaps the largest single opportunity for enhancing community resilience lies in the encouragement, the enhancement of existing nodes of capability and excellence. The most prominent of these for fire and emergency management are ranger groups. These groups have grown substantially in the last decade and have built a solid base of capacity by ensuring skills, knowledge and qualifications in fields as basic as driving a car to operating GIS.

North Australian Fire and Natural Hazard Training project purposes to provide a 'next-generation' training program that builds on the current assets in the north such as the ranger programs and leads to increasing levels of competence and confidence and in its turn, resilience.

PROJECT BACKGROUND

This report is about an attempt to establish new and relevant training units in fire and emergency management in Northern Australia. By way of background, it is important to recognize that fire and emergency management in Northern Australia is quantitatively and qualitatively different to that in the south of the continent. The geographical scale of natural disasters such as cyclones, floods and bushfires are legendary. For fire alone, an average of 430,000 km2 is subject to fire annually, much of it in severe late Dry season fires that contribute to destruction of assets, environmental degradation and the majority of the region's greenhouse gas emissions.

The enormity of the scale of these disaster events is juxtaposed with a low population and confounded by the remoteness and poverty of resident communities.

Nearly 360,000 of the people living northern Australia are in communities with varying degrees of remoteness from 'outer regional' to 'very remote'. These communities are predominately inhabited by indigenous Australians with the percentage rising in direct proportion to remoteness. Annual widespread flooding disrupts their lives and livelihoods, with many communities more than 150km from the nearest hospital becoming inaccessible by road for more than 90 days per year. Manycommunities are within 50km of the coast and are vulnerable to storm surge, erosion and sea level rise (18 cm in the last 20 years around Darwin). In the last decade cyclones and flooding have caused the destruction and evacuation of whole communities including some that have no incidence of cyclonic events in living memory.

While the disastrous numbers are impressive compared to southern Australia, it is perhaps the qualitative differences that underpin the need for a new suite of training materials. After all, fire is fire, flood is flood and it seems inuitive that the nature of preparation, response and recovery to each should be scalable and therefore applicable in any context. But stakeholders have made it clear that believe that their needs and their world view have not been addressed in training to date.

There are three jurisdictions in the north. Both Queensland and Western Australia are politically and demographically centred south of the Tropic of Capricorn and their agencies have developed comprehensive training capabilities that are applied uniformly across each state. Inevitably these courses primarily treat with the ermergency and fire management needs of the more populated areas, and these are predominantly in sub-tropical areas. The Northern Territory agencies generally adopts/adapts materials developed in more southerly jurisdictions.

It should be said that the training that is available is essentially sound and the support of northern Australian communities by agencies has typically been generous and accommodating. But the key qualitative differences matter to remote north Australians and importantly, addressing these issues may aid dealing with the quantitative issues raised above. In workshops and discussions the key qualitative difference seems to be world view or mind set.

While there is a strong narrative in southern Australia that 'we live in a bushfire-prone environment and we have to learn to live with it', this deterministic view is

not shared in the north. Here Indigenous Australians as well as pastoral land managers and agency personnel perceive the fire regime (in particular) as something that is malleable and responsive to human agency. Fire is is a tool that can (and should) be used to achieve agreed landscape and local objectives including community safety, biodiversity, aesthetic, cultural, greenhouse and amenity outcomes.

Technologies and practices to achieve this are being shared and developed informally across the north, incorporating the best of modern scientific information and technology with ancient understandings of fire/land interactions. The West Arnhem Land Fire Abatement project (WALFA) has been an important catalyst in this sense. A regular program of planning and seasonal debrief meetings have been the source of a program of adaptive management to which fire and land managers from across the north have been keen participants. The capabilities that are being developed in participating communities and shared with others from Broome to Cairns have contributed to community resilience in both the growth of skills and knowledge, but also in increases in wealth and workplace participation.

The workplace participation is particularly relevant insofar as the work of fire and land management for the broad range of objectives mentioned above is fundamentally aligned with the aspirations and cultural preoccupations of many remote communities. Work is conducted on-country, with family, utilizing traditional knowledge and achknowledging traditional owner's rights and responsibilities. This deep cultural affinity with land management as a lifestyle and responsibility, in addition to the notion of fire as a tool to be husbanded sets up an inevitable disconnect with much existing training derived from the southern Australian paradigm.

For this reason stakeholders in an early workshop sought to have the establishment of an overarching objective for training. The statement that training should "support north Australian needs and world view" has been adopted as an approximation of the complex of interwoven concepts discussed above. There is no similar stated overarching objective for the existing suite of fire and emergency management training. If there were such an objective it might be something like "to keep people safe". This is a laudable aim and one that is strongly supported by all north Australian practitioners, but as indicated, they seek more.

WHAT THE PROJECT HAS BEEN UP TO

REVIEWING EXISTING TRAINING AND EDUCATION

This project is a response to north Australian stakeholder concerns that existing training is inadequate for their needs. To assess this a review of existing training has been undertaken, focusing on the offerings available through CDU and its Registered Training Organisations.

CDU offers courses in the VET and HE streams through several campuses, with different campuses delivering a given course in different contexts and with varying parameters. For example, the Bachelor Institute of Indigenous Tertiary Education only delivers to indigenous students and has a framework, including allocation of resources and time for courses that varies from other campuses.

Twenty one courses ranging from Work Safely and Assist with Prescribed Burning (VET) through to Interdisciplinary Aspects of Emergency and Disaster Management (HE) appear to offer a broad suite of education packages for aspiring fire and natural hazard managers. Together they cover all aspects of disaster and a number are delivered in courses that place fire at least in the context of ecology (in both VET and HE streams) (see table 1). These offerings provide prospective students with high-quality training and profer qualifications that will enable graduates to access the workplace with skills and knowledge that are transportable across jurisdictions. There is no suggestion here that the offerings are in any way inadequate or in need of revision. They are what they are and provide a valuable contribution to fire, land and disaster management in northern Australia.

There remain however three areas where there is a perceptible gap which is addressed by the current project. The first is that, as stated in the background, the fire management training is designed in southern Australia. It is valid in all its materials, fire is fire and everywhere spreads faster uphill, however there is no treatment of the scale of the management task in the north. Tailoring of delivery does occue and the safety lessons within the PUA and AHC courses are essential knowledge for fire managers. It is not proposed here that they be replaced, but rather that they are added to.

The second component that is essential to a comprehensive fire and disaster management training regime for the north is the incorporation of indigenous knowledge. It is now acknowledged that Aboriginal people managed the landscape using fire at the national scale and the knowledge and practices that underpinned that remain operational to varying degrees in the north. The incorporation of Indigenous knowledge and practices, as well as sensibilities is an essential component of any management regime established in remote north Australia.

Perhaps the main difficulty of these existing courses is that they are distributed through the institution in different faculties, streams and settings. It can be speculated that an individual who completed all of the offerings would potentially be able to make a significant contribution to fire and emergency management, but this would not be as a unified qualification.

Qualification	Unit Description	Training Package	Location
Cert I CLM (AHC10110)	AHCOHS101A Work Safely (C)	AHC10	Cas (I, E, MM)
Cert 2 CLM (AHC21010)	AHCOHS201A Participate in OHS processes (C)	AHC10	Cas (I, E, MM) AS (p-time)
Cert 2 CLM (AHC21010)	PUAFIR204B Respond to wildfires	AHC10	Cas (I, MM)
Cert 3 CLM (AHC31410)	AHCOHS301A Contribute to OHS Processes	AHC10	Cas (I,M)
Cert 4 CLM (AHC31410)	AHCOHS401A Maintain OHS processes	AHC10	Cas (I, MM)
Cert 4 CLM (AHC31410)	PUAFIR303B** Suppress wildfire	AHC10	Cas (I, MM)
Cert 4 CLM (AHC31410)	PUAFIR407B Conduct prescribed burning (E)	AHC10	Cas (multimodal)
Dip CLM (AHC51110)	PUAFIR406B Develop prescribed burning plans	AHC10	Cas (MM). RPL-VEH
DEM514	Cultural, Social and Psychological Aspects of Emergency and Disaster Management	HE (Health)	Cas (I,E)
ENV507	Fire Ecology and Management	HE (Environment)	Cas (I,E)
ENV207	Fire Ecology and Management in North Australia	HE (Environment)	Cas (I,E)
DEM511	Emergency and Disaster Management in Context	HE (Health)	Cas (I,E)
DEM512	Interdisciplinary Aspects of Emergency and Disaster Management	HE (Health)	Cas (I,E)
DEM513	Leadership in Emergency and Disaster Management	HE (Health)	Cas (I,E)
DEM514	Cultural, Social and Psychological Aspects of Emergency and Disaster Management	HE (Health)	Cas (I,E)
DEM515	Reflective Case Study	HE (Health)	Cas (I,E)
DEM521	Research Project	HE (Health)	Cas (I,E)
ENV202	Introductory Remote Sensing	HE (Health)	Cas (I,E)
ENV502 (equiv unt SES201)	Remote Sensing	HE (Environment)	Cas (I,E)
HSC260 (equiv unit GPB401	First Humanitarian Mission (Project)	HE (Environment)	Cas (I,E)
PRBM019	Strategic Governance and Management	HE (Business)	Waterfront (I)
AHC10110 Cert 1 CLM	AHCOHS101A Work Safely (core)	AHC10	Bachelor TER, BAT, CAR, DPC
AHC10110 Cert 1 CLM	AHCOHS201A Participate in OHS processes (Elective)	AHC10	Bachelor TER, BAT, CAR, DPC
Cert 2 CLM (AHC21010)	AHCOHS201A Participate in OHS processes (C)	AHC10	Bachelor TER, BAT, CAR, DPC
Cert 2 CLM (AHC21010)	AHCFIR201A Assist with prescribed burning (E)	AHC10	Bachelor TER, BAT, CAR, DPC
Cert 3 CLM (AHC31410)	AHCFIR201A Assist with prescribed burning (E)	AHC10	Bachelor TER, BAT
Cert 2 CLM (AHC21010)	PUAFIR204B Respond to wildfires (E)	AHC10	Bachelor TER, BAT, CAR, DPC
Cert 3 CLM (AHC31410)	PUAFIR204B Respond to wildfires (E)	AHC10	Bachelor TER, BAT
Cert 3 CLM (AHC31410)	AHCOHS301A Contribute to OHS Processes (C)	AHC10	Bachelor TER, BAT
Cert 4 CLM (AHC31410)	AHCOHS401A Maintain OHS processes (C)	AHC10	Bachelor TER, BAT, DPC

Cert 4 CLM (AHC31410)	PUAFIR406B Develop prescribed burning plans (E)	AHC10	Bachelor TER, BAT, DPC
Cert 4 CLM (AHC31410)	PUAFIR303B Suppress wildfire (E)	AHC10	Bachelor TER, BAT, DPC
Cert 4 CLM (AHC31410)	PUAFIR407B Conduct prescribed burning (E)	AHC10	Bachelor TER, BAT, DPC
Cert I CLM (AHC10110)	AHCOHS101A Work Safely (C)	AHC10	Cas (I, E, MM)
Cert 2 CLM (AHC21010)	AHCOHS201A Participate in OHS processes (C)	AHC10	Cas (I, E, MM) AS (p-time)

TABLE 1

FIRE AND DISASTER RELATED TRAINING AVAILABLE THROUGH CDU

One thing that is apparent from the review undertaken here, is that the ease with which a prospective student can gain information about courses, pre-requisites and how to enroll is markedly easier through the BIITE website than the main CDU portal. In fact navigating the CDU site is relatively difficult, even for those with an existing tertiary qualification and this may prove a barrier for young people and clients with English as a second or third language who seek to gain a qualification, either through VET of HE at CDU.

PREPARING TRAINING UNIT DESCRIPTIONS

The core of this project is the development of new training materials; 'courses' or 'packages' that provide remote north Australian communities the skills and knowledge to manage landscape scale fire regimes as well as a range of other natural disasters. Notwithstanding that the final outcome of this development may be a suite of materials that are integrated into both VET and HE streams, a decision has been taken at the outset to design courses consistent with the VET framework. This will provide for the relatively straightforward mapping of courses into both VET and HE streams, as appropriate, toward the end of the project.

The unit description outlines the key information needed to deliver the course including a description of the Application of the Unit, Evidence Guide, Range Statement, Elements and Performance Criteria, Required Knowledge and Skills and Pre-requisites/Co-requisites.

WRITING TRAINING MATERIALS

The training materials will provide a complete package that will allow a comptent and qualified trainer to deliver training to the target audience. Given that the audience resides in remote north Australia and that the material is targeted at the inculcation of the skills and knowledge to manage fire and natural hazards across the remote north Australian region, this material needs to be comprehensive, provide for the cultural sensitives and language variations as well as reflect local knowledge and contexts.

The development to date establishes a comprehensive Powerpoint™ with notes to guide delivery of the information with examples, links and other materials in electronic and print-based form to ensure that the presenter can get on with the course without having to do too much preparation. A print-based laminated

"board will also be created for use in remote locations where computer-based delivery is not feasible but these have not been started yet.

A range of other course presentation techniques are being planned including the use of 'sandpit' modelling where remotely sensed data is projected onto a three dimensional surface (the sandpit) in an interactive process where course participants get to design and discuss the landscape, its features, their priorities for management and so on. This interactive process is just one where local trainers can lead participants through the subject at hand anchored in the local context. The training materials will detail the technical setup of the model and scope the rollout of the 'lesson'.

Assessment tools have been created that have been designed to be flexible enough to use with the full range of possible audiences based on experience to date of the types of client groups who would undertake these units. They prioritise application of the course learning into their own work/life practice to ensure that they begin the process of reframing their thinking and actions through this new understanding.

A range of hands on activities have also been developed. As with the assessment tasks these require the learner to use the information presented to inform their own situation by working through a process of re-thinking their own practice informed by the world view and information presented.

Much of the above will be set out in a Course Delivery Handbook, work on which will occur towards the end of the course materials development process.

The courses have been submitted as drafts units to a stakeholder representative group at a work shop in May. The workshop was designed to elicit feedback at an early stage of the work and comprised a broad cross-section of stakeholder groups including staff members of CDU, BIITE, Indigenous land and fire managers, Land Councils and government agencies from the three northern jurisdictions. The process sought to obtain immediate 'general' feedback on the course materials developed so far with this to be followed-up by more considered review by the participants as part of an ongoing evaluation process.

The feedback from the workshop was very positive; "I love it. It presents blackfella way using white-fella words...I want to take it back and use with my colleagues..." Interestingly feedback identified the problems with engagement in formal accredited courses because of the onerous nature of assessment expectations and time commitment to successfully complete them. This concern has informed assessment task design and the nature of materials being created to make them more achievable. Whilst the development of accredited courses is an aim of the project the materials can be easily adapted for less formal delivery to overcome this blocker. The Handbook will take this into account to ensure the unit delivery does not lose its 'edge' and become an empty box-ticking exercise.

Care has been taken to avoid reproducing existing materials. The review of courses covering information for this sector is a vital mechanism to achieve this. More importantly, there has been a lot of effort put into developing materials that start from a different foundation e.g. presented from stated 'north Australian world view' rather than from the viewpoint of the dominant culture.

A great deal of consideration has been (and will be) given to the mode of delivery in order to cater for learning that involves presenters from a range of cultural backgrounds and "the voice" of all stakeholders is presented through a range of different materials such as film clips, recounts etc. The broader Australian situation is examined so that regional and jurisdictional differences can highlight the range of different ways that this work is undertaken and the factors that influence these differences.

A range of courses or units were identified in the intial stages of the project requiring the preparation of new materials. Table 2 sets out the units and the state of progress in their development. An example of a draft of a completed unit is provided as Attachments A and B (the units will remain 'draft' until they have been piloted, evaluated and edited at the completion of the project.

One important element of the attached teaching materials is the fact that it is not set out as a sequence of facts to be learned. This has become a common strategy for much of competency based training; the modern equivalent of 'chalk and talk' where instructors work serially through a logical set of steps and students follow, doggedly trying to remember things because they will be tested on them later. Without detracting from the unit descriptions, which must necessarily outline skills, knowledge and range statements etc the project has set out to establish a transformative pedagogical approach. This establishes a didactic context where the deeper scaffolds of the information are understood. The key element underpinning this approach is, again, the difference in the world view current in remote north Australian populations.

The material attached also demonstrates that, despite a late start to the project, considerable progress is being made.

Training Unit/Course Title	Description	Current Status
Non-Indigenous and Indigenous Management Principles	New Unit	Draft Unit descriptor and training materials completed
Applying Indigenous Fire Management Processes in North Australian contexts: Climate, Weather and Fire Interactions	New Unit	Draft Unit descriptor and training materials completed
Savanna Fire and Ecology	Existing HE Course @ CDU	To be adapted
Advanced Situational Awareness and Dynamic Risk Assessment	New Unit (adapted from existing materials)	To be commenced
Apply Standard Operating Procedures (SOPs)	New Unit (adapted from existing materials)	Draft unit descriptor completed
Tactical Leadership	Existing non-accredited Unit	To be adapted
Participate in Debrief	Existing non-accredited Unit	To be adapted
Community Engagement and Cultural Protocols	New Unit	Draft Unit descriptor and training materials completed
Advanced Navigation (with/without GPS)	New Unit (adapted from existing materials)	To be adapted
Apply Web-Based Fire Management Tools	New Unit	To be commenced

Use ICT to Monitor Program Delivery	New Unit	To be commenced
Safety Around Aircraft	Existing Unit	Existing VET Course
Operate Aerial Incendiary Equipment	Existing non-accredited Unit	To be adapted
Develop Operational Work Plans	New Unit	To be commenced
Understand Legislative Basis for Operations	New Unit	Draft Unit descriptor and training materials completed

TABLE 2

PROPOSED TRAINING UNITS AND THEIR CURRENT STATUS

ESTABLISHING EVALUATION PROGRAMS

Evaluation of the project has been embedded into its development and delivery. Two distinct evaluation components have be established to ensure the quality of the material produced is high, but moreover, to ensure that the objective of providing training that speaks to the needs of the stakeholders is achieved.

Dr Petra Buergelt is working on the evaluation of the development of the training. This involves reviewing material as it develops and most importantly, facilitating and participationg in review workshops with stakeholders. The first of these on 28 March 2015 has been followed up with a questionnaire of participants. Initial feedback from the evaluation process has been positive, albeit with recommendations for changes and improvements to specific elements of the course material.

A second element of the evaluation is being undertaken by ARPNet. Dr Bev Sithole has agreed to support the project by engaging ARPNet to evaluate the delivery of pilot training in communities. This work, which will be undertaken at the time of pilot course delivery, will be a significant enhancement to the project because of the nature of ARPNet research. The evaluation will be undertaken by local people from the relevant remote communities, working within their respective languages and cultural contexts using tools developed for the project specifically. This promises to generate a detail and authenticity in the evaluation that transcends more common 'tick and flick' course evaluation.

PRESENTING TO BNHCRC FORUMS

The project coordinator has made presentations about the project to a number of forums established by the BNHCRC. These include the AFAC/BNHCRC conference in Wellington NZ in September of 2014, the Research Advisory Forum in Sydney in April 2015 and the North Australia Fire Managers Forum (NAFM) in Cairns in June 2015.

Perhaps unsurprisingly, the most enthusiastic response to the presentations was at the NAFM. Feedback from the forum was positive and reinforcing. Many participants, both in session and in breakouts concurred with the guiding premise of the project, the proposed approach to course development and the need for local input into delivery.

WHAT NEXT?

The key agenda items for the next year include:

- Continuing development of training unit descriptions
- Continuing development of training course materials
- Planning and delivering pilot training sessions at three north Australian communities
- Evaluating the training
- Documenting training/education pathways
- Reviewing new materials in the context of key emergency management training needs.

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PUBLICATIONS LIST

Paper presented at the 2014 AFAC/ Bushfire and Natural Hazards Conference "Learning from Adversity" entitled "Training: How do we build north Australian community capacity to manage fires and other natural hazards at a landscape scale".

CURRENT TEAM MEMBERS

Mr Ken Baulch, Bushfires NT

Dr Peter Jacklyn, RIEL, CDU

Mr Ed Hatherly,WA Dept Parks and Wildlife

Ms Tracey Fairman, Northern Land Council

Mr Terah Guymala, Wardekken Land Management

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