

Report to the West Cumbria Sites Stakeholder Group

Thursday 7th October 2010

Reports are issued every six months prior to the West Cumbria Sites Stakeholder Group main scrutiny meetings and are available on the WCSSG website: www.wcssg.co.uk

Representatives from Sellafield Ltd attend the WCSSG meetings and will be happy to respond to any questions.

SUMMARY

Sellafield Ltd has achieved a number of significant milestones since the last scrutiny meeting in April 2010, including:

- Skips removed from Pile Fuel Storage Pond.
- SPRS was the first major project to be completed by Sellafield Ltd, under the ownership of NMP and was delivered ahead of schedule and under budget.
- Liquid waste transferred from ageing silo.
- Pond purge unit installed and commissioned in historic pond.
- Successfully transferred 14,800 litres of historic radioactive liquid waste from a fifty year old waste storage silo for safe treatment.
- Removed the remaining fissile material from the Prototype Fast Reactor Fuel Fabrication facility, enabling it to be reclassified from a category 1 to a category 3 facility, reflecting a significant risk reduction.
- Successful completion of the first returns of HAW from the UK - having completed the first two shipments to Holland and Japan and the containers successfully received in the stores in April and June respectively.

BUSINESS IMPROVEMENTS

Work continues through the Integrated Change Programme (ICP) to identify and deliver efficiencies across the business. During 2009, 18 change programmes were established and many of these have been delivering significant changes over the last few months. These include;

- Move to a projectised organisation structure within the business to improve the alignment of support services to delivery programmes.
- Implementation of a revised and reinvigorated behavioural safety programme to re-emphasise personal safety performance.
- Introduction of new project management procedures to improve consistency in planning and delivering projects.
- Implementation of a new management system improving clarity and ease of use of formal procedures and instructions.
- Development of a Disciplined Operations Manual clearly setting our operational standards.
- Establishment of resource mobility arrangements to allow best use of our resources.

Other programmes have been driving organisational changes such as the establishment of the Technical and Engineering capability.

Targets set for efficiencies and acceleration last year were achieved. Each area of the business has prepared a Performance Improvement Action Plan identifying the improvement activities they intend to implement over the next 4 years and the expected benefits from the change activities. These documents will also show how the improvement activities will impact on the key milestones within the Sellafield programme with particular focus on the key hazard reduction areas.

Sellafield Ltd offered Voluntary Severance (VS) terms to its workforce in June 2010, concurrent with but separate to the formal consultation that ran between May and August. Employees were invited, with no obligation to continue to register an 'expression of interest' in the terms within a four-week period. At the end of that period, the company had received some 1030 expressions of interest.

Since then, the company has undertaken a rigorous review of those expressions of interest, in keeping with its Management of Change processes, and working closely with senior managers, heads of profession, and the regulator. Decisions to 'release' or 'retain' are being shared with individuals in two phases, according to their inclusion in and impact on the Nuclear Baseline. The final phase of decisions is being communicated on Wednesday 15 September. Employees who are approved for release have a period of time in which to seek legal and financial advice (both funded by the company) before making a final decision about whether or not to leave the company under VS.

Until this final stage of the process is complete, we cannot know the final numbers of people leaving under VS. However, the company remains extremely confident that it can achieve the headcount reduction of up to 800 (about which

we entered formal consultation) through both voluntary means and agency supplied workers (ASW) requirements.

In addition to legal and financial services, the company is also providing 'outplacement' resource centres and is working in partnership with Jobcentre Plus and Next Step to provide one-to-one employee support.

SAFETY & SECURITY

Safety

Sellafield Ltd is now a full member of the World Association of Nuclear Operators (WANO); a position which provides the opportunity to work with other members of the worldwide nuclear industry to share best practice and continually improve our nuclear safety performance. The company will also have an entitlement to appoint a governor to the WANO Paris Centre governing board to help scope the future direction of the WANO organisation.

Environmental Health, Safety and Quality (EHS&Q) resources have now been successfully integrated into the delivery directorates. This is a major milestone for EHS&Q, involving the movement of approximately 700 EHS&Q staff allowing clear accountability and efficient working arrangements.

As a management team and a site as a whole our overriding business priority is safety. With world-class expertise in all areas of safety, including nuclear, conventional, radiological and environmental safety we have built up an excellent safety record. This has further improved with the introduction of processes such as Learning from Experience (LFE), Safety Shares, to give increased focus on safety at all times and the Peer to Peer observation process. The introduction of the Peer to Peer Observation process has led to over 14,500 observations being completed to date by 4,200 employees across the company, we are also seeing increasing numbers of man hours worked without a lost time accident, with the current figure standing at 3.5 million man hours.

Since the last scrutiny meeting on 1st April 2010, the following incident reports have been published in the Sellafield newsletter.

- A survey in a radio chemistry laboratory has identified an area of spillage in front of a fume hood. A barrier was placed around the laboratory to restrict access while the area was cleaned. Analysis of the spillage has indicated that it was at a reportable level and therefore it has been recorded as a Sellafield incident and an investigation is ongoing into the cause. There is no evidence of dose to personnel as a result of this event, which is below the International Nuclear Event Scale.

- Whilst walking between buildings in the active area, an individual tripped over a kerb and suffered a fractured elbow. A safety inspector has visited the scene of the accident and found there to be no workplace contribution to the injury, as the kerb, road and footpath are in good order. However the nature of the injury the individual received means that the event is reportable as a major injury under RIDDOR.
- During a plant shutdown in Thorp Plutonium Finishing Line (TPFL) a number of proof tests were suspended and subsequently reinstated, pending TPFL plant restart. Following a review by the Maintenance Management System Department, an anomaly was found regarding outstanding suspended maintenance. Of the 10 items of the equipment that had been suspended, no work orders were found for five of the proof tests, meaning that the plant had been operated without valid proof tests being in place for the affected plant items. Nobody was injured or placed in any danger as a result. The event has been classified as below the International Nuclear Event Scale.
- On Monday 16th August piling was being undertaken for the retaining wall at external services on the Evaporator D project. The piling rig caused a mercury temperature sensor in a sub-station to trip and as a consequence power was lost for a short time to a number of surrounding facilities. The loss of power caused emergency shutdown systems to activate automatically and the affected plants were safely shutdown. All plants were quickly returned to service, nobody was injured and there was no risk to nuclear safety. This event has been classified as below the International Nuclear Events Scale.
- Health Physics monitors performing a routine survey in the Magnox Separation plant discovered a small amount of liquid on the floor. The liquid appeared to have originated from a small, redundant pipe. Monitoring showed an activity level that is approximately 30 per cent of the quantity regarded as notifiable under the Ionising Radiation Regulations and no 'activity in air' monitors were in alarm. Access to the facility was restricted and a seal cap was quickly fitted to the pipe. No one was hurt and the environmental implications are negligible. However, an investigation is underway. This event has been classified as below the International Nuclear Events Scale (INES).
- Sellafield Ltd has, regrettably, had its first incident in over seven months that is likely to register as a level one event on the International Nuclear Event Scale. Alternate safety systems would have picked up on any deteriorating conditions in the waste storage compartments in the Magnox Swarf Storage Silos. However, the waste compartment has two hydrogen analysers and at any one time at least one should be operational. One of the analysers was taken out of service for maintenance and engineers later discovered that the new piping to the

other analyser had been misconnected. This meant that there had been no hydrogen monitoring for six days in the compartment.

A full investigation and Board of Inquiry has been convened and The Nuclear Installations Inspectorate (NII) has been fully informed of the incident as safety regulator. The analyser piping has been repaired and the hydrogen analysers for all the other compartments have been checked. Monitoring of the compartment has subsequently shown that there was no build up of hydrogen the workforce's safety was not jeopardised.

Results of what will be a thorough investigation will be used to ensure lessons are learned and prevent such a lapse in the future, as safety is paramount at Sellafield and safety mechanisms must be operational at all times.

The event has been provisionally classified as a level one event on the International Nuclear Event Scale (INES), pending the Board of Inquiry report.

Also since the last meeting in April there have been several messages reported as follows that have generated interest:

Assisted Travel arrangements:

Sellafield Ltd made a firm commitment to Government to deliver accelerated nuclear clean up and high hazard reduction.

As part of that commitment the site has to become more efficient, and constantly strives to find efficiencies in all areas of the business in order to provide value for money for the UK taxpayer. In these troubled economic times it is even more appropriate that it does so.

For a number of years the company has provided an expensive assisted travel scheme with subsidised rail fares and buses for staff to help them get to and from work. The scheme is severely under used and provides benefit for only a very small number of employees considering the significant cost to the tax payer.

As part of our ongoing programme of work aimed at meeting the challenges of the current economic environment and driving sustained cost efficiency throughout the organisation, Sellafield Ltd is changing the Assisted Travel Scheme with effect from 1 October 2010. This will realise savings in excess of £1m per.

There are two commercial services which are to be offered by coach companies and these will begin from October 1st.

Only a small percentage of the workforce at Sellafield will be in any way affected by the changes and our drive to improve the efficiency of the company is for the ultimate benefit of the whole of West Cumbria.

Sellafield Ltd has also committed to work with any individuals for whom genuine hardship has been caused as a result of the change.

Provision of Towels:

As part of our wide ranging change programme an initial proposal had been made by the company to consider removing towels from changing rooms, thus significantly reducing the load on the site laundry, with both financial and environmental benefits.

However, having discussed the proposal further with the unions it has been agreed that the initial proposal be removed and that both sides work jointly to improve the efficiency of the laundry and changing rooms while maintaining an appropriate level of welfare to our employees.

Sellafield Ltd is committed to working in partnership with the unions to achieve the changes and cost efficiency throughout the business that is needed in order to build a sustainable future.

Security

Since the last report the security priorities for Sellafield Ltd have been integration of security arrangements and the further development of our emergency arrangements, specifically with regard to Counter Terrorism (CT) incidents.

The security regulations require Operators of civil nuclear licensed sites to have an approved Site Security Plan in place, which describes the standards, procedures and arrangements adopted to ensure security of nuclear premises, nuclear material and sensitive nuclear information. Historically, Sellafield and Windscale sites were regulated against separate Site Security Plans. In July 2010, the security regulator approved the integration of the Windscale site security arrangements into the Sellafield Site Security Plan, this is a significant security milestone for the sites.

Sellafield Ltd has an obligation under the security Regulations and the Site Security Plan to have CT contingency plans that are reviewed and exercised regularly, at least once in a twelve month period. One of the principle aims of CT exercising is to test the command and control of site nuclear security

arrangements and situational awareness to assess if effective and proportionate measures are in place to counter the malicious event. A CT exercise (live-play) involving Sellafield Ltd and Civil Nuclear Constabulary (CNC) was carried out on the 1st February 2010 and observed by the security regulator, Office for Civil Nuclear Security (OCNS). Further, a multi agency CT exercise (Desk-top) was carried out on the 21 June 2010, also observed by OCNS and NII.

OPERATIONAL PERFORMANCE

Sellafield MOX Plant

In May 2010 the NDA announced that a new contract for SMP had been signed with Japanese Utilities. This followed another challenging year for SMP, but improvements led to the highest ever production in all areas of the plant. The second 8 assemblies for our European customer have been completed ahead of forecast. The plant has moved into the transitional phase to prepare for Japanese BWR fuel. In parallel we are developing a new rod line based on a proven French design.

Magnox Reprocessing

Magnox Reprocessing underwent a scheduled outage from April 2010 to June 2010 to undertake asset-care activities across all of the plant areas within Magnox and in order to deliver a Physical Inventory Take (PIT) as part of our obligations to Euratom. All aspects of the outage scope and the PIT were successfully delivered enabling a return to operations in late June.

Sellafield Ltd has been working in partnership with the Magnox Reactor stations and the Regulators to increase fuel transfers to Sellafield for reprocessing and this has been successful. Fuel deliveries are just below the target figure and over 220 te of fuel has been safely transported to Sellafield so far this financial year.

Decanning rates have not achieved the planned target, due in part to unplanned outages in some of the downstream plants. The baseline target for the 2010/11 financial year is 570 te; Magnox is currently 80 te behind target for the year to date. There has been good progress on the processing of legacy fuel and the SIXEP plant, which marked its 25th anniversary in this period continues to be instrumental in supporting hazard reduction activities across Sellafield.

Preparations are underway to commence defuelling Reactor 4 at Calder Hall during October 2010 and transfer that spent fuel for decanning and reprocessing; this will be a significant milestone for Magnox and Calder Hall.

Thorp Reprocessing

This financial year to date 175 tonnes of fuel have been sheared, against a stretch financial year end target of 300 tonnes. It is anticipated that this shear target will be achieved early in 2011. After approximately 250te have been sheared Thorp will enter an engineering outage to allow essential plant maintenance activities to take place as well as the inspection of the HALES (Highly Active Liquor Evaporative Storage) evaporator. The HALES evaporators are a key downstream effluent management plant, concentrating the Thorp HAAR (Highly Active Aqueous Raffinate) and MA (Medium Active) effluent prior to Vitrification, and are intrinsically linked to Thorp operations. They are also subject to re-licensing by the regulator to support further Oxide reprocessing beyond the 300 tonnes through Evaporator C. The HALES evaporator inspection is a key element of this re-licensing activity.

There have been some technical issues with the operation of one of the Chemical Separation HA (Highly Active) cycle pulsed columns earlier in the year that restricted the throughput rate within the Chemical Separation part of the reprocessing cycle. A programme of work was instigated to investigate and subsequently resolve this issue by the introduction of a "chemical wash" to the column. This proved successful and the throughput restriction has been removed and successfully demonstrated in the last 2 months.

Waste and Effluent Disposition

The HAST 9 cooling water event which was reported at the April WCSSG meeting led to a wide ranging corrective action plan being enacted across the site. Improvements have been implemented across the site to the control of isolations. An improvement notice was issued by NII relating to training of personnel performing isolations. The issues were addressed and the Improvement Notice was closed within the required timescale.

Evaporator `A` was taken out of service whilst a leak on a reagent feed line was investigated. A significant amount of inspection work and corrosion assessment has been performed to support a return to service targeted for late November 2010. Evaporator `C` has continued to support the upstream plants throughout the period.

The WVP production outturn at the end of FY 2009/10 was an excellent 382 containers (4634teU equivalent). Production since then has been slow with work being undertaken to diagnose and repair faults in the container handling area of the process which was affecting operations. Throughputs are expected to improve as WVP Lines 1 and 2 return to service.

Improvements to the WVP line 3 shield doors have commenced following successful acknowledgement by NII. Further safety case submissions will be made in late September 2010.

The first return of vitrified waste was received and processed in Japan; and the first European return was successfully shipped and processed in Holland. Preparations are in hand for the second return to Japan.

The Waste Encapsulation Plant (WEP) is currently failing to meet THORP's acceleration target requirements. An improvement team and plan have been put into place and work against that plan is currently ongoing. All other plants within encapsulation are meeting site requirements.

In the Waste Operating Unit the Waste Treatment Complex has completed a planned outage for maintenance and modifications to introduce a new drum transfer system. The plant is now back up and running and has compacted 761 drums in the year to date which is ahead of the planned throughput.

WAMAC has continued to support site operations

During waste handling operations in April four LLW waste bags were released from Sellafield to the Lillyhall landfill site which were above the acceptance criteria for that site. All four bags were retrieved within a few days and an investigation by the Environment Agency (EA) and the Department for Transport (DfT) is currently ongoing.

Metal recycling is progressing well with 450 te achieved so far this year. Two shipments of material have been made to the Studsvik metals recycling facility at Lillyhall.

DECOMMISSIONING

The Decommissioning Directorate has recently presented the Annual Review of Environmental Health, Safety and Quality (EHS&Q) to the regulator community. Feedback on the presentation was positive.

Pile Fuel Storage Pond

Following the successful export of the first skip, 16 additional skips have been removed from the Pile Fuel Storage Pond. The skips have been wrapped and disposed of suitably, making space for pond floor de-sludging operations.

Operations to mobilise sludge and transfer it into the in-pond corral has started. This is a positive step forward as the sludge will be stored in modern standard containment prior to being processed through the Local Sludge Treatment Plant (LSTP).

Magnox First Generation Storage Pond

A significant step forward in hazard reduction has been taken in the Magnox First Generation Storage Pond with the delivery, installation and commissioning of the pond purge unit. The unit introduces the caustic dose required to maintain the correct PH level in the pond and in addition pumps clean water into the pond. As water is removed from the pond for processing in SIXEP the addition of the clean water from the Pond Purge unit will ultimately reduce pond liquor activity levels reducing the dose uptake to workers during future retrieval operations.

The manufacture of the Hot Tap Test Rig was completed in July which was well in advance of the stretched target of 21st August. This rig replicates the physical plant geometry and enables operatives to train on techniques which will be used when they carry out isolations of the Redundant Effluent and Sludge Pipework System (RESPs).

Magnox Swarf Storage Silo

The first successful transfer of 14,800 litres of historic radioactive liquid waste was carried out in the Magnox Swarf Storage Silo. The process, known as Liquor Activity Reduction (LAR), removes active liquor from the silo and transfers it via the Effluent Distribution Tanks (EDT) to the Site Ion Exchange Effluent Plant (SIXEP) where the active effluent is treated. Since the initial transfer, two additional transfers have been carried out with a total of 42.7m³ now being transferred.

This first production transfer marks the start of a scheduled programme of LAR movements to SIXEP designed to reduce the activity of silo liquor by about 90% over the next three or four years. Following this, the solid waste inventory will be removed from the facility, processed and encapsulated for safe long term storage.

On 24 August it was noted that one of the two hydrogen analysers servicing a compartment in the Magnox Swarf Storage Silo had been wrongly connected. Details of this incident has been covered earlier in the report under the 'incidents' section.

Pile Fuel Storage Silo

In preparation for the start of waste retrievals from the Solid Waste Storage Silo, a new passive Off Gas System has been introduced to replace the current forced ventilation system. This system will bring about a significant reduction in argon gas usage of at least 50% a year which will result in a cost saving of about £140k.

Site Remediation and Decommissioning Projects

A 10 year programme of work has recently been concluded to meet a Nuclear Installations Inspectorate License Instrument Specification for the continued safe operation of one of their facilities as an interim beta gamma waste store. This detailed programme of work has included activities such as the removal of wastes, installation of cell covers and the construction and cladding of a new overbuilding.

This work has lowered dose rates to workers and has brought the facility up to modern engineering standards.

The first piles have been drilled for the construction of the new Separation Area Ventilation (SAV) stack. The stack will enable diversion of ventilation streams from existing legacy facilities to a new purpose built ventilation facility. This will enable decommissioning on the legacy stacks to be progressed.

Foundation work for the fan building is also well progressed.

Windscale

The decision has been made to scale down the programme of work at Windscale to enable the Decommissioning Directorate to focus resources on removing higher hazards and reducing higher risks within the Directorate in line with the Site's priorities.

Operations and cave line refurbishment works in the Active Handling Facility will continue in accordance with Life Time Plan 10 (LTP10) however, responsibility for the execution of cave line refurbishment works has transferred to the National Nuclear Laboratory (NNL). This will attract additional investment in the facility from NNL.

In the Redundant Active Handling Facility decommissioning operations will cease but the Safety Case Improvement Action plan work will be completed and the facility will be placed in a state of surveillance and maintenance.

Pile 1 decommissioning operations will cease as soon as it is practical to do so, and Pile 1 and Pile 2 will then be placed in a state of surveillance and maintenance.

Finally, work on the WAGR decommissioning activities will continue to an acceptable conclusion within available funding.

Windscale care requirements covering facilities placed in surveillance and maintenance will also be reviewed to ensure that Safety and Site Licence compliance is maintained.

SOCIO ECONOMIC ISSUES

Since the development of the Britain's Energy Coast Investment Plan 2010/11, HM government has embarked upon fundamental changes to the structure for funding local development, whilst, in the immediate term, cutting the budgets of the Regional Development Agencies (RDA's) until they are disbanded in 2012.

Sellafield Ltd, along with our Funding Partners NMP and NDA, is working closely with the local authorities and regeneration organisations, to re-align priorities for socio-economic development in West Cumbria through the Energy Coast initiatives.

Our £3.1m socioeconomic budget for 2010/11 is assigned as follows:

- West Cumbria Development Fund £1.5m
- Energy Coast Projects £1.0m
- Sellafield Ltd Education Programme £0.5m
- Sellafield Ltd Small Charitable Donations £0.1m

FORWARD PROGRAMME:

Accelerating high hazard and risk reduction was our major challenge during the year and will continue to be our focus going forward. Put simply, this means that we are concentrating on developing and implementing packages of work to clean up the ageing storage ponds and silos at Sellafield; to ensure that our stocks of highly active liquid are safely managed and reduced and that all of the nuclear waste on the site is stored in fit-for-purpose containment.

While there are still many challenges for us to face in these areas, we are making encouraging progress.

2009/10 was a year of discovery, facing challenges and making progress. There will be many more challenges to come but I am confident that the combined skills and experience of Sellafield Ltd and the parent body organisations, we can overcome them and as ever, throughout all of this our commitment to safety is paramount.

List of Acronyms:

AFO	-	Authorised firearms officers
AGR	-	Advanced Gas Cooled Reactor
ASW	-	Agency Supplied Worker
BERR	-	Business Enterprise and Regulatory Reform

BNGSL	-	British Nuclear Group Limited
BOC	-	Bottom Outer Coil
CAGR	-	Civil Advanced Gas Reactor
CHPP	-	Combined Heat and Power Plant
COBRA	-	Cabinet Office Briefing Room 'A'
COGEMA	-	French government owned nuclear group
CNC	-	Civil Nuclear Constabulary
CSW	-	Contractor Supplied Worker
CT	-	Counter Terrorism
DACR	-	Days Away Case Rate
DTI	-	Department of Trade and Industry
EAC	-	Endorsement for Active Commissioning
EARP	-	Enhanced Actinide Removal Plant
E&EP	-	Effluent and Encapsulation Plant
EHS&Q	-	Environmental Health, Safety and Quality
EPS	-	Encapsulation Plant Store
EPS2	-	Encapsulation Plant Store 2
FCRT	-	Fuel Channel Retrieval Tool
FHP	-	Fuel Handling Plant
HA	-	Highly Active
HAL	-	High Active Liquor
HALES	-	Highly Active Liquor Evaporative Storage
HANO	-	Highly Active North Cell
HAST	-	Highly Active Storage Tank
HAW	-	Highly Active Waste
HLWP	-	High Level Waste Plant
HMIC	-	Her Majesty's Inspectorate of Constabulary
HSE	-	Health & Safety Executive
ILW	-	Intermediate Level Waste
INES	-	International Nuclear Event Scale
INS	-	International Nuclear Services
LLW	-	Low Level Waste
LLWR	-	Low Level Waste Repository
LRQA	-	Lloyds Register Quality Assurance
LTA	-	Lost Time Accident
LTP	-	Life Time Plan
MA	-	Medium Active
MAC	-	Medium Active Concentrate
MER	-	Magnox East River
MBGWS	-	Miscellaneous Beta Gamma Waste Store
MOX	-	Mixed Oxide
NDA	-	Nuclear Decommissioning Authority
ND&MPG	-	Nuclear Decommissioning and Major Project Group
NII	-	Nuclear Installations Inspectorate
NOK	-	Nordostschweizerische Kraftwerke AG - Swedish Utility

NM	-	Nuclear Material
OCNS	-	Office of Civil Nuclear Security
ORM	-	Other Radioactive Material
OSHA	-	Occupational Safety & Health Administration
PACSR	-	Pre-Active Commissioning Safety Report
PCM	-	Plutonium Contaminated Material
PF&S	-	Plutonium Finishing and Storage
REF	-	Residues Export Facility
RIDDOR	-	Reporting of Injuries, Diseases & Dangerous Occurrences Regulations
QA	-	Quality Assurance
ROV	-	Remotely Operated Vehicle
SAV	-	Separation Area Ventilation
SDP	-	Silos Direct Encapsulation Plant
S&DNSC	-	Sellafield and Drigg Nuclear Safety Committee
SMP	-	Sellafield Mox Plant
SOCPA	-	Serious Organised Crime and Police Act
SPP1	-	Sludge Packaging Plant 1
SPRS	-	Sellafield Products Residues Store
THORP	-	Thermal Oxide Reprocessing Plant
TPFL	-	Thorp Plutonium Finishing Line
TRC	-	Technical and Residues sub committee
UKAEA	-	United Kingdom Atomic Energy Authority
UKSO	-	UK Safeguards Office
VIT	-	Vitrification
VPS	-	Vitrification Product Store
WANO	-	World Association of Nuclear Operators
WCDA	-	West Cumbria Development Agency
WCDF	-	West Cumbria Development Fund
WCSSG	-	West Cumbria Sites Stakeholder Group
WEP	-	Waste Encapsulation Plant
WPEP	-	Waste Packaging and Encapsulation Plant
WTC	-	Waste Treatment Complex
WVP	-	Waste Vitrification Plant