

IITRAAA-VAANI

Inaugural Issue

*New year's greetings from
IITRAAA-VAANI to all the
members of IITRAAA, the
IITR Alumni and their families*

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FROM THE EDITOR'S DESK

Welcome to the newly initiated introductory issue of the e-news bulletin of IITRAAA named as IITRAAA VAANI. We really mean this to be the voice of IITRAAA and that is why we named it so. The issue will be released quarterly in the first week of January, April, July and Oct every year. We intend to include the IITRAAA news, scientific and general interest snippets, short articles on any general interest topic, jokes, relevant legal write-ups, income tax guidelines etc. Much of its success will depend upon your creativity and contributions. You are welcome to contribute to make it more attractive, appealing, recreational, useful and a wallet of wisdom. In fact I would like to create a list of individuals who would like to write on their specific field of interests. Just mail me your name and area of interest on vijai11946@yahoo.co.uk

It is also intended to publish the specific achievements by any alumnus. Greetings and good wishes on birthdays, and marriage anniversaries will also be included in subsequent issues. We can also include the news about new additions in the family as well as marriage of your sons and daughters. Members are requested to send the relevant details on my email address as above.

This issue includes the news about activities of the last quarter, an article on WILL making, income tax for FY 2010-11 and a scientific snippet on US Space Shuttle. We hope the articles by the members and alumni will be pouring, for our next issue of April 2, 2011 and in the time to come.

Let us not remain unconnected

Thanks and regards,



Vijai Kumar

Vijai Kumar
Editor In-Chief
IITRAAA-VAANI



NEWS

New Look of IITRAAA website

Our website has been given a face lift to have better aesthetics and user friendliness. The members are welcomed to open the site www.iitraaa.com and enjoy the information encapsulated in it.

Further fine tuning is under progress and will be completed shortly. Sri Anil Roy has taken the trouble to renovate the same with the help of his students in DAIICT.

IITRAAA conveys its gratitude for the same.

PAN IIT organizes IIT Conclave PAN IIT, Gujarat Chapter, organizes its first conference 'IIT Conclave: Technology and Development' on Jan 11'2011 at NIRMA University between 1400 hrs to 1700 hrs on the auspices of Vibrant Gujarat 2011. Honourable Chief Minister Sri Narendra Modi will address the Conference. All IITRAAA members are requested to register (free of cost) for the conclave. You may contact Mr R Sunil Parekh on paniitgujarat@gmail.com. Further details of the conclave could be seen on website www.paniitgujarat.org

IITRAAA to bring out a Souvenir

It has been decided to bring out a souvenir- 2011. Members are requested to contribute articles, stories, quotable quotes, word of wisdom, jokes etc for the purpose. The write ups may be sent to the President Mr A C Mathur.

Saturday, December 25, 2010

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Welcome to our website

Roorkee College was established in 1847 as the first engineering college in British Empire. The college was renamed as "Thomason College of Civil Engineering" in 1857. In Nov 1949 the erstwhile college was elevated to the first Engineering University of independent India, which has recently been renamed again as IIT-Roorkee.

IIT Roorkee Alumni Association, Ahmedabad Chapter (IITRAAA) plays an active role in bringing together the alumni in Ahmedabad and Gandhinagar, Gujrat. The association is basically a social and cultural organization having involvement of the members and their families. The association primarily facilitates in remembering the memory of our Alma matter and its rich traditions. The chapter also encourages the members and their families to use the forum for strengthening friendship family ties by organizing get together, cultural meet, picnics and popular lectures of common interest. Association also keeps in touch with its head quarter at Roorkee and keep the members informed of the important developments and events taking place at the institution.

To know more about the association and its activities, click on the relevant titles on this page.

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December 2010

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Snapshot view of the new IITRAAA website

EVENTS

Family Get-together

A family get together was organized on Sunday Oct 10' 2010 at Gujarat Police Academy, Karai, Gandhinagar. Reaching to this site itself was an adventure. The Academy was situated on the banks of river Sabarmati and its campus with promenade looking over the river is a sight to behold.

Delicious "Pakorاس' were served as welcome breakfast for the members along with their families, numbering around 50. Alumni Mr. Hemanshu Tushiar (2002) and Mr. Subir Basak (1991) were the newcomers in the program. With tummy filled with pakoras it was time to go for sports and games.

Sport competitions like basket ball, cricket and couple race were organized. Members and their families participated in the competitions while enjoying a dose of vitamin-D showered by the God Sun. Thus the breakfast vanished fast and the stomachs were empty again. Delicious lunch prepared by the academy's volunteers was ready then, which was served hot to the delight of members. Lunch was followed by quiz competition, evening tea and prize distribution. The program concluded with the vote of thanks by the president Mr A C Mathur. More details about the program can be seen on the website www.iitraaa.com



KNOW ABOUT “WILLS”

A will is a document which contains the last wishes of a person as regards the manner and mode of disposition of his property. “Will” signifies a wish, desire or choice of a person regarding legal disposition of his property. It is the legal declaration of the intention of the testator with respect to his property which he desires to be carried into effect after his death. A Codicil is an instrument which explains, alters or adds to the disposition of a will and it is deemed to form a part of a will.

Every individual owns a reasonable amount of wealth, particularly immovable properties. He has complete discretion on how he wants to deal with his property. He can give property to some persons he wants and avoid others. Several succession disputes regarding the business arises after the head of the family dies intestate. Through a will a person may reward his friend, old servant or an employee, which would not be possible otherwise. Making a will does not mean an insurance against succession disputes. Often it is said where there is a will, there is a legal dispute. The same was witnessed in Pryamvada Birla’s will in favor of Rajan Lodha, the chartered accountant of the testator.

The preparation of will does not require any specific legal language. It can be written in any language. There is no specific legal format. It need not be even typed. It can be in the hand writing of the testator or any other person. A will need not be stamped or written on a stamp paper. No stamp duty is payable on will. It can be written on a plain paper. The registration of will is not compulsory. However, the registration has its own advantages e.g. loss of a will, challenging the authenticity of a will. A person can change or revoke his will as often as he desires. Ultimately, the last valid will prevails over earlier wills, if any, executed by the testator. It is therefore, normally mentioned in every will that this will revokes earlier wills (except first will). People of all faith and religion can make a will. However, in case of Muslims, according to Islamic Law only 1/3 of the property can be bequeathed by way of will and the balance 2/3 of the property shall devolve according to applicable “Shariat Law.”



pic courtesy: savethechildren.org.uk

In case a person does not prepare a will and dies, his property would devolve as per the applicable succession law. In case of Hindus, Jains, Sikhs and Buddhists, as per Hindu Succession Act, 1956 and in case of Christians and Parsis as per the Indian Succession Act, 1925. Pursuant to section 30 of the Hindu Succession Act, 1956, a coparcener can bequeath his undivided share in the Hindu Undivided Family by way of a will. A will takes effect only after the death of the person making the will. Till, he is alive, it has no effect.

While preparing a will care should be taken to the effect that the testator's immediate family members should be described by names, age and relationship to the testator. Further it should also be made clear that who will get what property. If a family member is to be excluded, it is better to give reasons for his exclusion.

Members of armed forces can execute privileged will which may be oral or in writing, if such person is on expedition or engaged in actual warfare/combat. In other cases, the will should be in writing. The testator must sign the will or affix his mark like thumb impression on the will. It is advisable to sign each page of a will to avoid any dispute amongst the

claimants after the death of the testator. It must also be dated to give authenticity to the will that which is the last will. Section 63 of Hindu Succession Act requires that the will should be attested by two or more witnesses, each of whom has seen the testator sign the will or affix his mark. Each of the witness must sign the will in the presence of the testator. No particular form of attestation is provided. It is important to note that the attesting witnesses need not know the contents of the will. All that they attest, is the testator's signatures or thumb impression. Normally, a witness or his spouse can not be made beneficiary under the will as any bequest in their favour would be void. Normally, a professional such as a lawyer, a Chartered Accountant, Company Secretary or a Doctor who is known to the testator may be requested to act as a witness. This acts as a barrier against the claims that the testator was mentally unstable when he made the will. A will can always be revoked by the testator and an irrevocable will has no meaning.

A probate is a certificate from the High Court certifying the genuineness and finality of the will. It is the final word on whether the will is genuine or it has been obtained by fraud, coercion etc. For obtaining the probate, the applicable court

fee stamp is payable as per the rates prescribed in the different states and which may be linked to the value of property bequeathed. In Maharashtra, the court fee stamp for obtaining a probate ranges from 2% to 7.5% of the property value subject to maximum of Rs. 75,000/-. A will, suo moto, without obtaining a probate from a court is not accepted by the concerned companies or authorities as it is difficult for them to decide that which is the last will of the testator.

(by Mahesh C. Gupta, B. Com (Hons) MBA,
AICWA, FCS. LL.M.)

Quotable Quotes (Collection Source: TOI)

One of the great tragedies of mankind is that morality has been hijacked by religion - *Sir Arthur C Clarke*

Imagination is more important than knowledge
Albert Einstein

If we win, someone else loses. But if some one else loses we lose. Which is a point we're not getting - Neale Donald Walsch

Friendship multiplies the good of life and divides the evil
Baltasar Gracian

One liner humor (Collection Source:Mail fwd)

Regular naps prevent old age, especially if you take them while driving.

Bad officials are elected by good citizens who do not vote.

Laziness is nothing more than the habit of resting before you get tired.

My wife and I always compromise. I admit I'm wrong and she agrees with me.

Those who can't laugh at themselves leave the job to others.

A successful marriage requires falling in love many times, always with the same person.

You're getting old when you enjoy remembering things more than doing them.

It doesn't matter how often a married man changes his job, he still ends up with the same boss.

Real friends are the ones who survive transitions between address books.

They call our language the mother tongue because the father seldom gets to speak!

TYPICAL WILL FORMAT BY A HINDU IN FAVOUR OF FAMILY (TO BE MODIFIED SUITABLY BY THE USER)

This is the Last Will of mine, AB, etc., a Hindu, made this the day of, 20___, voluntarily and while in sound state of mind.

WHEREAS I am now 70 years old and have been keeping indifferent health for a past few months; AND WHEREAS I am possessed of considerable movable and immovable properties more particularly described in the schedule annexed hereto which are my self acquired properties and which were acquired without any detriment to the ancestral property or to the family funds and I have the absolute powers of disposal over the same .

AND WHEREAS I am anxious to make necessary arrangements in respect of the enjoyment of my properties after my life time so that unnecessary misunderstanding and consequential wasteful litigation between the members of my family may be avoided. Therefore, I am executing this last will and testament of mine of my own free will voluntarily without any compulsion or pressure of any person and with a sound disposing mind and declare as follows:

1. I hereby revoke all former wills and codicils made by me at any time heretofore.
2. I have my wife CD, two daughters EF and GH and two sons KL and MN who will be entitled to succeed to my properties under law in the normal course. But my daughters are all married and they are living separately with their husbands. They have been properly and well provided for during their marriage. They are therefore not given any share in my properties under this will.
3. I bequeath the property bearing No. Described as item No. 1 in the Schedule hereto to my first son KL absolutely to be held and enjoyed by him with full and absolute powers of alienation.
4. I bequeath the property bearing No. described as item No. 2 in the Schedule hereunder to my second son MN absolutely to be held and enjoyed by him with full and absolute powers of disposal.

5. I bequeath to my wife CD the property bearing No..... and described as item No. 3 in the Schedule hereto absolutely to be held and enjoyed by her with full and absolute power of alienation.

6. Any assets, movable or immovable, which might be omitted from being mentioned in this will or which may hereafter be acquired by me shall be taken by my wife and the two sons aforesaid in equal shares absolutely.

7. Though I have bequeathed no share in my properties to my daughters aforesaid , as a token of love and affection for them I hereby direct my two sons KL and MN that each one of them will pay to each one of my daughters a sum of Rs..... and this sum shall be a charge on the properties allotted to my above sons respectively hereto.

8. All the jewelry and ornaments, gold and silver, will belong to my wife absolutely and my sons or daughters aforesaid will have no right to the same .

9. I hereby appoint my two sons KL and MN as the joint executors under this will.

SCHEDULE OF PROPERTY

1..... 2..... 3.....

IN WITNESS WHEREOF I, the above named testator have signed this will hereunder the day and year first written above.

.....(Sd.) (AB)

Signed by the above named AB in our presence at the same time and each of us has in th e presence of the testator signed his name hereunder as an attesting witness.

WITNESSES: 1. 2

INCOME TAX GUIDE LINES FOR FY 2010-11

HOW TO COMPUTE INCOME TAX

Accounting of Incomes

One's income may arise in a variety of ways, some of which might not be known to one's employer; hence the corresponding tax would not have been deducted at source by employer. Thus one may have obligation to collate all incomes, compute the total tax, check how much of the tax is already deducted at source(s), and pay off the balance tax (or claim refund as the case may be).



pic courtesy: ci.wilmington.oh.us

For employees and pensioners, the main income would be 'salaries' (wages &/or pension) where there is no standard deduction – although certain components of salary could be tax-exempt (notably conveyance allowance, house-rent-allowance with 'receipt of rent', professional tax paid, scientific awards and professional update allowance).

Further, for just-retired persons, 5 types of Retirement

Benefits would be treated as tax-exempt incomes, viz Commuted Pension, Leave Encashment (at end), Gratuity, GEIS/ Insurance Proceeds, and Provident Fund/Interest. (Even for employees/pensioners, GPF/CPF/PPF interest is tax-exempt). As for family-pension, this income is not called 'salary' but an 'income from other sources' – from which a standard deduction of 33.3% (subject to maximum 15000 Rs.) is permitted.

pic courtesy: colorado-ts



The next most important type of income, which nearly all have, is interest (other than on PF). It is generally easy to collate this income, but still there are 3 common pitfalls – (i) The disbursed interest on fixed-deposits, senior citizens' saving scheme, etc. often would be the net interest after TDS (tax deduction at source), if interest of the year exceeds 10000 Rs. in a branch of bank. In this case, one has to mentally add the interest on all term deposits and consider the gross interest as the income, not the net. (ii) In cumulative deposits

even where interest is not actually disbursed, one has to consider the notional accrued interest of the year as income.

(iii) Any interest received on tax-refund is also taxable!

The third item, again quite common for many persons, is



pic courtesy: facebook

house property income. For self occupied house it is NIL – or even negative by way of subtraction of interest paid/payable on house loan/advance, up to 1.5 lakh. For vacant house, a notional rent minus

30% of the rent will be taxable income, unless the house is in one town and the person is serving in other town but not staying there in own house, in which case the notional rent will be zero. For actually rented house, income is the rent received or prevailing rent in the area (whichever is higher) minus 30% of the rent and the municipal taxes paid. In both latter cases, house loan interest (without any ceiling) can be deducted – even, net negative income may arise! [Such house losses can be set off against salary, pension and interest etc].

Deductions from Income

Before computing tax, you are allowed to reduce your taxable income, by qualified deductions. The most common deduction is called 80-C (PF, child education fees, principal paid for house loan, insurance, NSC, ELSS etc), along with 80-CCD (NPS) totaling maximum 1 lakh.



pic courtesy: principal first

There is a separate additional deduction towards specific infrastructure bonds, by section 80-CCF, maximum 20000 Rs. – but these are quite 'inconvenient' – not available round the year, many of them need demat account, tenure is 10 years (for maximal interest) or at least 5 years (fetching somewhat lower interest) – and the interest is taxable every year! Other common deduction is 80-G (donations). There are some specialized deductions like 80-DDB/80-U for handicap to

child/self etc.

Finally, the CGHS premium is deductible by 80-D. (Life time fee if applicable may be spread over number of years notionally). However the DOS & DAE adopt a different equivalent medical scheme known as CHSS and IT rules do not make specific mention of CHSS contribution also to be deductible at par with CGHS. Since CHSS is equivalent of CGHS in other Gov Departments, one can venture to claim deduction while filing IT return and go for appellate authority if not accepted by the IT Department)

Normal Tax Rates and Slabs

The net taxable income which is not subject to special rates of tax, is to be split into 4 components (slabs) and each slab has to be applied its rate of tax, and then these 4 taxes are to be added up (some of these may be 0).



pic courtesy: your income accelerator info

| | |
|-----------------------------------|-----|
| From 0 up to threshold | 0% |
| From threshold to 5 lakhs | 10% |
| From 5 lakhs to 8 lakhs | 20% |
| Component of income above 8 lakhs | 30% |

The summed tax has to be further augmented by its 3% as education cess.

The thresholds are:

- 2.4 laks for man/woman born on/before 31-3-1946
- 1.9 lakhs for woman born on/after 1-4-1946
- 1.6 lakhs for man born on/after 1-4-1946

Special Tax Rates

This is applicable in case of the payers who have sold house or shares etc. Details of this tax structure can be given on request to the editor.

Tax Avoidance without Evasion

A few situations permit you to reduce/avoid tax legally without any violation (evasion).

1) If you have minor (below 18 years age) children: By Sec. 10(32), each minor child can earn upto Rs. 1500 income tax free. (let's say, interest of 7.5% on 20000 deposit) without the need to club it with yours. If child is handicapped, there is no clubbing at all – e.g. you can deposit 20 lakhs/24 lakhs @7.5% for handicapped boy/girl child, and pay no tax up to threshold 1.6/1.9 lakhs. Whereas the same sum, had it remained in your hands, would have attracted tax on this interest @ your slab.



pic courtesy: mnforum

2) If you have a major but non-earning child or grand child (typically in the age span of 18 to 25): You can pass on 20/24 lakhs to such boy/girl and he/she being independent tax

entity, the income falls below threshold with zero tax, whereas had the sum continued in your hands, interest would have been taxed.

OBLIGATIONS AND PROCEDURES

Advance Taxes

If your estimated total tax minus expected TDS for the F.Y. exceeds Rs. 10000, you have obligation to pay this difference during the financial year itself in parts as 30%, 30% & 40% by Sept. 15, 2010, Dec. 15, 2010 and March 15, 2011 respectively. In making such 'estimate', you are not obliged to worry about future 'unexpected' incomes as you can not be expected to foresee these – e.g. late capital gain or arrear of salary/pension etc. You have to use challan ITNS-280 and tick boxes 0021 and 100; save the acknowledgment slip showing 7 digit BSR and 5 digit CIN (add initial zeros if digits are fewer) – indeed, preferably also request an OLTAS printout too. It is advisable to carry pan copy while submitting tax-challan. If there is unexpected income between 16 & 30 March, pay its tax by 31 March.

Self Assessment Tax and Interest

Despite one's best efforts, generally full 100% required difference (of `Tax minus TDS') is usually not paid off by March. Hence a bit more remaining tax is to be paid as `self-assessment-tax' in July 2011 (again, using ITNS-280, ticking 0021 and 300). Further, some `interest' may have to be paid as well. There are 3 types of interest, one has to calculate these separately and then add up.

a) 234A interest is to be paid only if 31-7-2011 deadline is missed (rate is 1% per month or fraction thereof).

b) 234B interest is to be paid from 01-4-2011 till (pre31/7) date of payment (same 1% rate) on the left-over tax. But 234B interest is waived if left-over tax <10% of tax.

c) 234C interest is to be paid for each shortfall in the 3 advance tax obligations (again, 1% rate).

Modes of tax payment are: Electronic (online) and Physical (cash/debit/cheque). Write cheque as “_____ Bank A/c Income-tax”, Write your name & PAN on back.

Filing of Return

One day after you pay the self-assessment-tax, you are ready with the data needed to fill-up and file the Tax Return- This should be finished by 31st July 2011. You have to file the Return even if no tax were due/no refund is claimed (just because employer has deducted exact tax, does not mean you need not file). Only if your basic income (even before taking Sec.80 deductions) is below your threshold, you need not file return.

You have to use SARAL-II (ITR-1) form if you own at most one house, and obtain income from salary/pension and/or other sources like interest/family-pension, but no other type of taxable income. If you own more than one house and/or have taxable capital gains, you have to use ITR-2. In both cases, no attachments are to be enclosed with the return, but save all relevant proofs like Forms 16/16A, receipts of PPF/ insurance etc. in case they summon you to show. Even when going to file return, it is safer to carry them along.

If after filing return, you realize that you have made some error/omission etc., you can file a revised return (provided the



pic courtesy: hubpages

original return was filed in time'). This restriction, and also the non-permission of claiming capital loss if filing late, and also the possibility of interest by Sec.234A, all lead to the conclusion that return should be filed in time (i.e. by 31/7/2011). If you delay beyond 31/3/2012, there will also be the added trouble of a fine of Rs. 5000. Further, not filing at all, can hinder any foreign tour, as tax acknowledgments of 3 years might be asked. (This is more applicable to emigration than to short tour). In fact it is advisable to preserve the income tax return copies and acknowledgments at least for the last seven years.

Modes of return filing are: Electronic (online-with/without digital sign – in latter case send ITR- Verification or ITR-V to Bangalore by Rs.5 cover only), and physical (at ITO of your Ward/Common or PO).

Refund Claim and Chase

In case TDS plus advance taxes paid by you, put together, exceed tax payable for the year, you can claim Refund in the return. However, you can write an inquiry letter (or visit ITO) to pursue the Refund, only in February 2013 (for the return filed in July 2011). Prior to that, you can check status of your

taxes paid into Govt. A/c., in Annual Statement called 26AS, either via Tax Information Network through NSDL (TIN-NSDL.COM) or at some banks' online A/c (e.g. SBI). Much trouble in this matter, arises because tax deducted at source (TDS) does not reach ITO. You have to request such deductor to send a correction statement to ITO. This year, compared to earlier years, there could be fewer such mismatches because, deductors have to inform you 4 (i.e. quarterly) TDS Returns' Acknowledgment Numbers and you have to quote these in the return.

Another new thing to streamline `refund chase' is that when you write them any letter (inquiry or complaint about refund, etc.), they have to formally `inward' it and generate/issue you a document identification number (DIN). You can quote this

DIN in the next level of follow-up query – they thus, can not deny having received your first query letter! No excuse like “can't find your letter” can now be given. Same goes for any supplementary attachment you give for the return – e.g. missing CIN or TDS Ack No. received later than deadline.

PAN – Importance and Procedure

Without PAN, your TDS rate will be 'highest' like 20% or 30%, and not nominal 10% (e.g. on Bank fixed deposit interest). For those below threshold, TDS prevention request (15G/15H) has to be accompanied by PAN copy. PAN and KYC (know your customer including the address proof) will be needed (starting Jan. 2011) for any transaction with mutual funds. Even Post Offices now-a-days ask for PAN to accept deposit. Hence do apply for PAN (even without income!) from franchisees like say, UTI-ISL, Federal Bank.



(By Dr Pranav Desai,
retired Chief Scientist, SAC)

Some Ans from kids (Source:Mail fwds)

A vibration is a motion that cannot make up its mind which way it wants to go.

The body consists of three parts - the brainium, the borax and the abominable cavity. The brainium contains the brain, the borax contains the heart and lungs, and the abominable cavity contains the bowels, of which there are five - a,e,i, o and u."

When you breathe, you inspire. When you do not breathe, you expire.

Many dead animals in the past changed to fossils while others preferred to be oil.

I am not sure how clouds get formed. But the clouds know how to do it, and that is the important thing.

Clouds just keep circling the earth around and around. And around. There is not much else to do.

Thunder is a rich source of loudness.

Germinate: To become a naturalized German.

To keep milk from turning sour: keep it in the cow.

THE END OF SPACE SHUTTLE JOURNEY

The US Space Shuttle program has gone through 30 years long journey starting from 1981 onwards. The program envisaged a spendable (consumable) rocket to carry the orbiters as piggy back and leaving it in a circular earth orbit. The shuttle was designed to carry astronauts and do space explorations in low earth orbits.

Its most popular application was to carry astronauts to ISS (international space station) which is located in low earth orbit of 278-460 Km around the earth. The orbiters were also intended to carry many scientific and technological experiments in orbit.

The orbiters were recovered after completion of each mission, by making it to re-enter the atmosphere and land on earth like an aircraft. After each flight the orbiters were refurbished for the next flight.

Initially only four orbiters were made namely, Columbia (1981), Challenger (1982), Discovery (1983), Atlantis (1985). However due to loss of two orbiters (Challenger and Columbia) in space accidents, one more orbiter was added and named as Endeavour in 1991.

A total of 134 space shuttle flights were planned for the total program.

The last flight STS 134 was planned to be launched in Nov 2010. However due to number of technical snags and time associated in their repairs, the last two flights STS 133 (Discovery as orbiter) and 134 (Endeavour as orbiter) have been delayed. As on today STS 133 has been tentatively scheduled for launch in Feb 2011. The schedule for the next flight STS 134 is not yet known.

Another need based flight STS-335 with Atlantis as orbiter, has also been planned in case STS 134 encounters any problem. The program is expected to be concluded with the launch of STS-134.



pic courtesy: wikipedia

The shuttle program known as STS (space transportation system) was first flight tested in 1981 and four flights were realized under the program. The operational flights started in 1982. The program envisaged a total of 134 flights.

All but two flights were successful. Two unfortunate incidences ended up as the worst space disaster, resulting in loss of human life and that of the orbiters/propulsion system.



pic courtesy: wikipedia

The first accident happened on Saturday, 28 Jan 1986 when the hot combustion gas leak of one of the solid booster during lift phase, resulted in blasting the vehicle off after 73 seconds,

separating the orbiter challenger from the main liquid tank. The injured challenger after separation had a free uncontrolled fall into the sea. All the seven astronauts were killed.

Second disaster happened on Feb 1, 2003 when the orbiter Columbia entered the earth atmosphere. Due to the damaged thermal insulation tiles, the orbiter got red hot and exploded. Here also all the seven astronauts died. Kalpana Chawala, the Indian astronaut was also one amongst the unfortunate crews who died in the mid space.



pic courtesy: wikipedia

STS includes three main systems namely two number of solid booster, one external liquid propellant (cryogenic) tank and the orbiter. The solid booster and orbiter's own engine fuelled by the external tank, burn together at the lift off. The solid boosters are separated after burn off, recovered from the sea and sent for refurbishing for next flight. The external liquid tank separates later after emptying the stored fuel and gets burnt up during re-entry into the atmosphere. Later maneuvers and re-entry to atmosphere are conducted with orbiter's own liquid propellant system powered with the stored fuel. The orbiter has its autonomous propulsion, navigation guidance and control systems and lands on the ground as an aircraft on the airstrip.

NASA do not plan a replacement of STS. To continue with future missions it depends now on private launchers and orbiters. The only known vehicle and orbiters being developed by the private entrepreneurs are ARES-I, II, III and ORIAN. In order to meet the time bound program, Russian Rocket/carrier Soyuz may be used to carry the astronauts to ISS.

Space shuttle has a great history and will be written in golden words in the history of re-usable space vehicles. All the out of service orbiters are planned to go to science and technological museums and defense establishments in USA for related studies, thus keeping their memory alive.

(A collection by Vijai Kumar from space science /technology journals)

Interesting features of Indian Rockets

India has developed two operational satellite launch vehicles (rockets), Viz PSLV & GSLV, to launch Satellites in various earth orbits and spacecrafts to interplanetary/earth orbit missions. Heaviest rocket GSLV mark III is under development.

GSLV mark III, the heaviest Indian rocket (under development), will weigh equivalent to the weight of about 315 elephants (630 tons) and be as high as 16 story building. About 75% of its weight will be consumed during the flight duration as burnt fuel. Also it will keep shedding its body parts during certain flight instance in order to economise the fuel need.

Out of a total weight of 630 tons only 4 tons, which is of the satellite, will remain in orbit. The remaining 624 tons gets consumed either as fuel or hardware separated from the rocket plunging into the sea or burnt up during re-entry to atmosphere.

The rocket is launched eastward from Shriharikota launch station, to take the advantage of rotating earth.